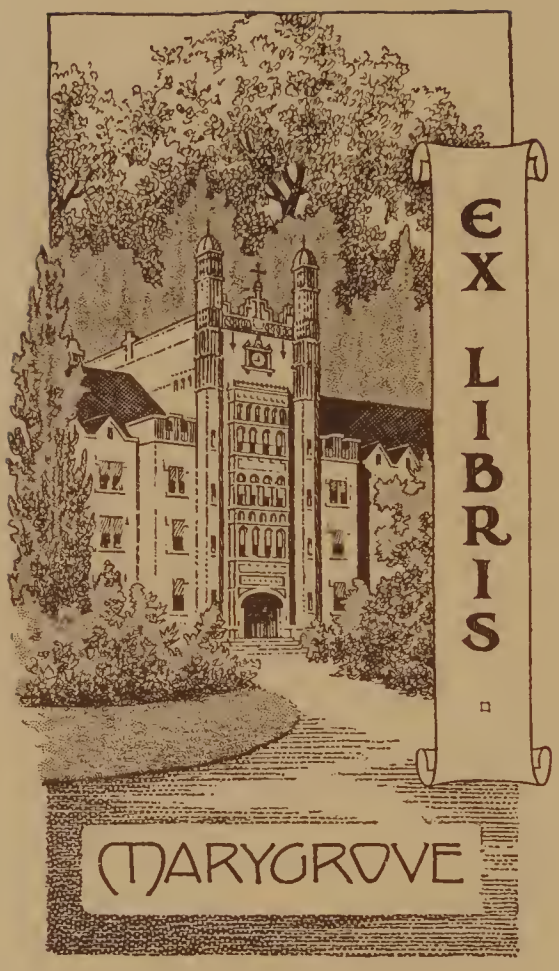
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MARYGROVE

BUILDING THE SCHOOL ORCHESTRA

A Guide For Leaders

BY

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To

My Wife

Who has been my constant counsellor
in the building of many school orchestras
this book is affectionately dedicated

PREFACE

This book is intended for use with public school music courses in normal schools, conservatories and colleges, and as a guide for instrumental teachers, whether class or private; for music supervisors, orchestra leaders, and school superintendents. It deals with problems of pedagogy, organization and administration as applied to orchestra work, and the teaching of instrumental music, and at the same time endeavors briefly to set forth such information concerning the various instruments as is deemed essential.

The author has felt that the increased significance of orchestral activity in the modern school and community demand a more specific preparation than that gained through a course of lectures or study of the symphony orchestra and its literature. Such information is invaluable to the concert goer and music lover, but not sufficient for the practical school orchestra organizer and director. The effort has been made also to work out a definite teaching plan which may be followed successfully by the inexperienced.

Lest some of the statements made, especially concerning shortening and enlivening the tedious learning process, seem hypothetical and visionary, the author wishes to say that they are the direct outcome of an experience extending over twenty years with orchestras in the public schools, churches, clubs and industrial institutions of Chicago, Minneapolis, in the rural districts of northeast Missouri, and elsewhere, rather than a setting forth of theories.

The author wishes to make grateful acknowledgment to Mr. J. E. Maddy and to Mr. T. P. Giddings for the contribution of the chapter on Class Procedure and to Mr. Giddings for the chapter on Intonation; and to both Mr. Maddy and Mr. Giddings for much helpful criticism of the manuscript from the technical and pedagogical viewpoints.

RAYMOND N. CARR.

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INTRODUCTION

A study of the school orchestra begins with a study of the symphony orchestra but does not end there. The problems encountered in the two can be more readily contrasted than compared. The fact that players of symphonic ability are more advanced than those of grammar or high school age is one of the least of the differences. For the symphony orchestra leader, the first requirement is that he be a musician. The school orchestra leader must be a teacher, organizer and administrator first, but a musician also. The former has only skilled performers under his baton; the latter may have one pupil who has studied five years, another who has studied only five months, and another who has studied only five days, all sitting side by side. He is always under obligation to find a way to solve the problem caused by this diversity.

A symphony orchestra usually plays a composition as it is written. All instruments that the score requires are present, or may be had merely by hiring them. In the school orchestra, the missing instruments cannot in all cases be supplied, and the leader must be able to make the consequently necessary transpositions and substitutions.

In the symphony orchestra, most of the compositions are contrapuntal — different instruments or groups carrying various independent melodies. The average school orchestra must limit itself to those of plainer, more harmonic style. Therefore, in the school orchestra, first and second violin parts are not equally interesting, nor do the players possess equal ability. Here, second violins, violas, and the whole brass section have an entirely different function to perform. The double bass has a subordinate position, and the tympani are neglected. The oboe, English horn, bass clarinet and bassoons are almost of necessity conspicuous by their absence.

On the other hand, the piano, cornet, and bass and snare drums swing to the front line of importance, and even the trombone (not the trombones) snorts out for its share of attention. The superb French horn has gone, and left nothing in its place except possibly the mellophone or Eb alto, popping along with the second violin and viola on "afterbeats."

Most musicians and teachers have hitherto assumed that no amateur orchestra can be organized in any institution or community unless there is the "material" for one. Hence this book. The material, we find, must always be developed, not discovered; created, if you will, not just invited to assemble. Here again, the whole problem is different. The symphony orchestra goes to the next largest city or to another continent for its material; the school orchestra develops it right in its own school, and out of nothing. This is always true, no matter how large the school or how well favored the community. Even in those localities where orchestral propaganda has been carried on successfully for some time, and a good orchestra is present, the building process must be carried on systematically, always preparing players to take the places of those who will soon leave school or graduate. Some metropolitan orchestras find it advisable to do this. The school orchestra must do it, but in a different way.

The symphony orchestra has a musical object principally; the school orchestra must be carried on for more broadly educational purposes. It should be conducted in a school room, in school hours, and by one of the regular teaching corps. Its object may be thought of as mental discipline primarily. Its by-products are along musical, cultural, and voca-

tional lines. The orchestra also serves a valuable social and moral purpose. Energy that might otherwise be expended to no purpose is concentrated on a constructive program. Many a boy has been led to the profitable use of spare hours as well as perhaps the serious study of music, by being given the opportunity to learn to play a horn at school.

The symphony orchestra leader is all too often a driver with a sarcastic tongue and a profane code of instructions. The school orchestra director must be a leader with tact and patience, and a man or woman of irreproachable character, patriotism and devotion to true modern educational ideals.

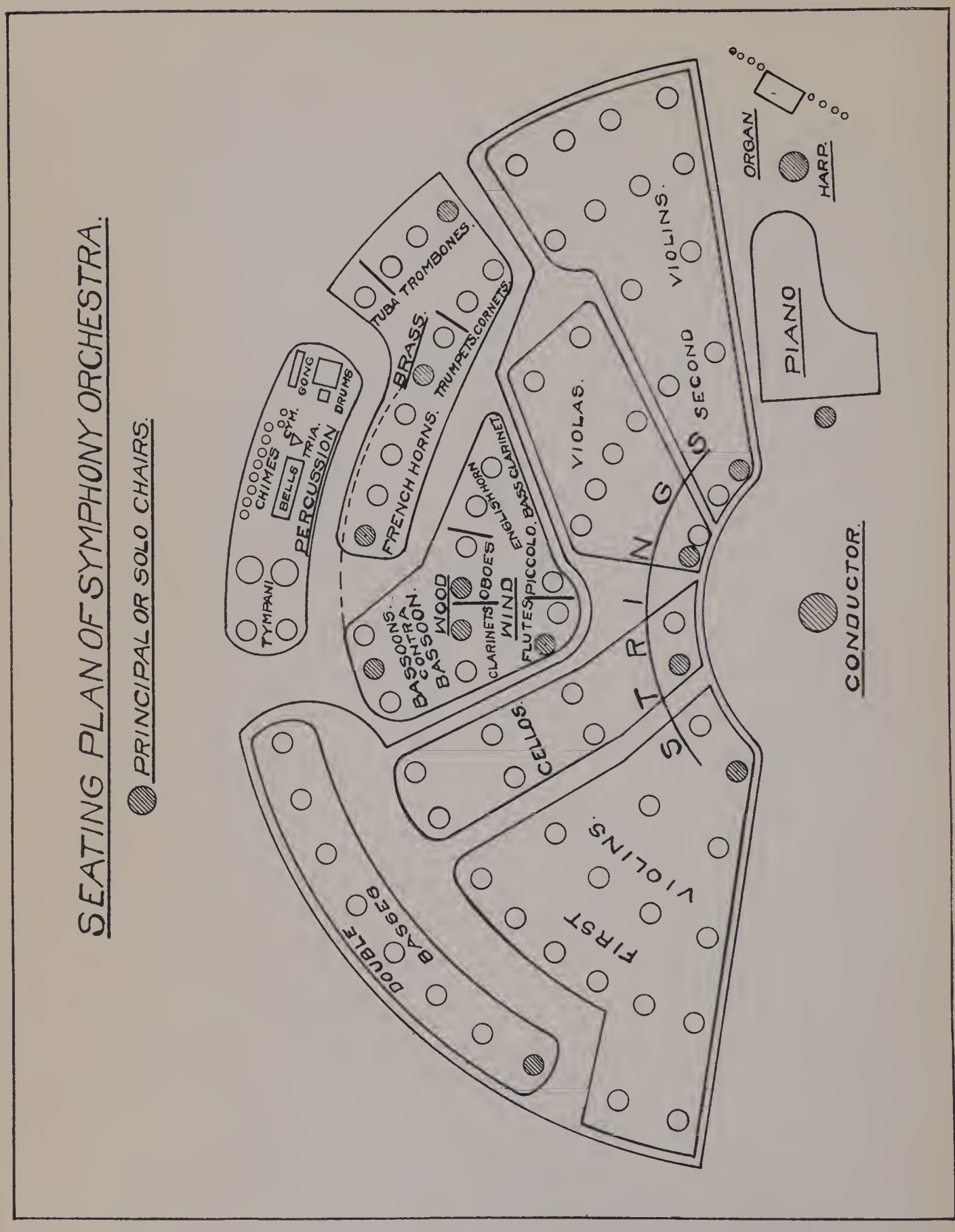
The school orchestra leader should know how to tune and play the scale and simple music on as many of the principal instruments of the orchestra as possible; though this is not absolutely necessary, as will be seen in later pages. But he should understand the purpose and function of each instrument, and be able, if necessary, to arrange orchestra music from the piano or vocal score. He should know how to select orchestra instruments and orchestra music; in short, all the "what", the "why", and the "how" of this branch of instruction, which is coming to be recognized as an essential part of every liberal curriculum from the kindergarten to the university.

As a supplement to this volume, "The Universal Teacher", by J. E. Maddy and T. P. Giddings, will be found invaluable as containing the musical material for carrying out the suggestions in "Building the School Orchestra", together with detailed instructions for the pupil as to the particular problems of his instrument, and further suggestions to teachers.

CHAPTER ONE

THE ORCHESTRA

An orchestra is a collection of several different kinds of instruments playing together as one. From four to twenty-four or more different kinds of instruments may be represented, and from four to one hundred or more players may be included.



A symphony orchestra is one which is suited to the performance of symphonies. It usually contains sixteen or more different kinds of instruments and at least sixty players.

As a medium of musical production, the orchestra has many advantages. The learner on an orchestral instrument can practice many hours daily without the fatigue which would follow a like amount of vocal practice. This permits him to acquire greater technical ability than the vocalist often possesses. The orchestral instrument has the advantage of the pianoforte in that it can produce a single long-sustained tone. The large orchestra excels both the chorus and the pianoforte in the number of tones of different pitch that may be produced at the same time, in the number of independent melodic figures that may be carried simultaneously, and in the variety and range of color and dynamic force. The symphony orchestra represents the highest attainment in music.

The instruments of the orchestra are divided into four groups, according to the material of which they are made and the manner in which they are played. They are (1) Strings, (2) Woodwinds, (3) Brasses, and (4) Percussion. Each group contains members which correspond readily to the soprano, mezzo-soprano, contralto, tenor, baritone and bass qualities in the human voice.

I

THE STRINGS

The Violin, Viola, Violoncello and Double-Bass.

The structure of the orchestra is built around the choir of stringed instruments. This is often referred to as the "quartette", though in reality it becomes a quintette by the division of violins into first and seconds; and by dividing similarly the other instruments or by further subdividing the violins, as many as sixteen separate parts easily may result.

The string choir is the most reliable section of the orchestra. It can play steadily through the longest composition without the fatigue that wind instrument players experience when they play continuously. The hearer, moreover, does not tire so quickly as when listening to the more highly colored but less varied wind or brass tone.

The string instruments are made of wood with an air resounding chamber within. Four strings of catgut are stretched tightly over the top, fastened at the larger end of the **tail piece** and at the other to **pegs** which fit well into the **scroll.** The strings are called the **first, second, third,** and **fourth,** respectively, beginning with the smallest. Near the larger end they are supported by the **bridge,** the height of which permits the strings to lie at a convenient distance from the **fingerboard.** By looking through the **"F"-holes** into the chamber, the **soundpost** can be seen, almost under the bridge. This not only helps sustain the pressure of the strings, but also assists in transmitting the vibrations to the back of the instrument. Bridge and soundpost are mechanically fitted to the smallest fraction of a millimeter and accurately placed. The slightest variation in fit or placement would change or mar the tone quality.

Tone is produced by means of a resined horse-hair **bow** on the strings. The bridge is arched in such a way that the bow strikes only one string at a time. The pitch of each string may be changed by pressing it against the fingerboard with a finger of the left hand, shortening the vibrating portion of the string. When the music calls for two tones at once, the player may hold the bow in such a way as to affect two strings. This is called **double-stopping. Harmonics** are produced by touching the string very lightly. They are light, bodiless tones used for special effects.

The volume and quality of tone are dependent upon the handling of the bow. An uneven and squeaky tone may be produced by adjusting the hair of the bow too tightly or too loosely; by too much or too little pressure of the bow upon the strings; by too much

or too little resin on the hair; or by unsteady movement of the bow. To increase the volume of tone, pressure is placed upon the bow, or it may be moved more rapidly. For tones which are to be emphasized the player will use the lower part of the bow (nearest the hand); and for quieter and softer effects, the upper part (nearest the **point**). The bow is said to be moving **down** or **up** according as the hand is moving away from or toward the instrument, respectively. As the down bow is for accented tones, the up bow is never used for the first note of a phrase unless it falls on an unaccented beat. When the composer or arranger wishing to specify, the sign (⊓) is written over the note to indicate **down bow**, or (V), meaning **up bow**. The direction of the bow changes with each tone unless the **slur**, or phrase mark, indicates that two or more tones are to be produced with one movement of the bow. **Staccato** effects are produced (1) by stopping the bow suddenly; (2) by permitting it to bounce over the strings from its own elasticity (saltando); or (3) by plucking the strings with the fingers (pizzicato). Moving the bow back and forth with very rapid, short, wrist strokes (tremolo) produces mysterious or exciting effects. The tone of the instrument may be somewhat reduced and otherwise modified by slipping a specially made comb (mute) over the top of the bridge. This may cause the tone to seem dreamy and far off.

THE VIOLIN

The violin is the most familiar and undoubtedly the most popular orchestral instrument in America. In fact, it is so familiar that little need be said about it here. It is the leading instrument in the orchestra. The first or E string is most used. This is the "chanterelle" or singer, being the most brilliant of the four. The A string is more mellow; the D somewhat sober; and the G rich and sonorous because of its being wound with fine wire. The violin takes the soprano or alto part in the string quartette.

THE VIOLA

The viola is in appearance only a large violin. To it is assigned the tenor part in the string choir, though it may take an alto part equally well and in some cases is assigned a light bass. Its tone is the most somber of all the stringed instruments and it is rarely used as a melody instrument.

THE VIOLONCELLO

Nearly everyone is familiar with the appearance of the large violin-like instrument which the player must sit down to play, resting it against his knees. It is called the cello, (pronounced **chello**). Next to the violin it is the principal melody instrument in the string choir and perhaps in the whole orchestra. Harmonically, it may occupy the position of bass; in fact, in former times it was so used almost exclusively. But to most listeners its great attractiveness is due to the wonderful singing quality of its chanterelle or "A" string. Its rich resonant tenor quality rivals in sweetness and power even the golden-throated tenors of the operatic stage. Truly a lovely instrument, it has been neglected in America, partly, perhaps, because of its slightly inconvenient size.

THE DOUBLE BASS

The double-bass is called also, colloquially, the bass viol. It is a rather unwieldy instrument, the full size being six feet seven inches in height. It may usually be seen standing at the back or at one end of the orchestra. In the classic orchestra its chief use was to "double" the bass of the cello, playing it an octave lower. In the modern orchestra it may do the same, or have a suitable part of its own.

THE WOOD-WINDS

The Piccolo, Flute, Oboe, English Horn, Clarinet, Bass Clarinet, Bassoon and Contra-Bassoon.

The wood-wind choir in the symphony orchestra is next in importance to the strings. As the name indicates, the instruments are made mostly of wood. Tone is produced by the action of the player's breath in setting the column of air within the instrument in motion. The pitch is controlled by the lips and breath, by pressing the fingers over holes bored along the top of the instrument, and by a more or less elaborate system of keys.

In 1832 Theobald Boehm invented a system of keys for the wood-wind instruments which greatly increased their facility of execution and multiplied their usefulness. This system is now used exclusively on some of the wood-wind instruments.

THE FLUTE (Flauto)

The flute is a cylindrical instrument about two feet in length. It is made of wood or of silver. Its tone is simple, pure and more uniform in character throughout its compass than that of any other instrument. It is, however, somewhat dull in the lower register as compared with the sweetness of the middle or the brilliance of the upper tones. The Boehm system is used almost entirely by professional players, and even among amateurs the old Meyer system is rapidly falling into disuse. Both tone and technical possibilities of the former are greatly superior.

The flute may be used as a melody instrument either alone, or in unison with other instruments. It is also used as a super-soprano for the carrying of ornate obbligatos to strings and other groups. It corresponds to the coloratura soprano of the human voice.

THE PICCOLO (Kleine Flauto)

The piccolo is a flute of half the regular size and one octave higher in pitch. A flute player in the orchestra may change to piccolo for extremely brilliant passages or piercing tones. The tone is too shrill for continuous use.

The flute and piccolo are usually built in C, which means that C on the flute or piccolo corresponds to C on the piano or pitch pipe. For band use, however, a flute and piccolo built in Db are used, C on these instruments corresponding to Db on the piano or pitch pipe. Music for the "band" flute and piccolo is therefore written one-half step lower than it actually sounds.

THE OBOE (Hautbois).

The oboe is a slightly smaller instrument than the flute or clarinet. It has a conical tube. Two small reeds bound securely together and inserted in the smaller end of the instrument constitute the only mouthpiece.

The tone of the oboe is penetrating, pungently reedy, somewhat nasal in the lower register and too thin and weak in the higher register to be very effective. Its peculiar, sometimes plaintive tone may easily be heard standing out from the other wind instruments and above almost the whole body of strings. For pastoral effects, it is unexcelled as a solo instrument.

So small an amount of air passes through the double reed that the player feels almost as if he were holding his breath. It is, consequently, very tiring and frequent rests are necessary. Its tone is capable of very little modulation as regards either color or volume, and in a lengthy solo would become monotonous.

The pitch of the oboe is almost incapable of variation by tuning. Therefore it is essential that a perfect instrument be used. In the symphony orchestra all other instruments are tuned from the oboe.

The oboe corresponds to the lyric soprano of the human voice.

THE ENGLISH HORN (Cor Anglais)

The English horn is not English and is not a horn. The derivation of its name is a matter of conjecture. It is, in fact, an alto oboe. Its conical tube is slightly longer than that of the oboe, and the bell is globular instead of flaring.

The English horn is built in F, C on the instrument sounding the same as F on a pitch pipe or piano. Its music is therefore necessarily written a perfect fifth higher than it actually sounds.

THE CLARINET (Clarinetto)

The clarinet was the last of all the wood-wind instruments to be adopted by the symphony orchestra. Its tone is fine, full, and expressive. In the upper register it resembles the mezzo soprano of the human voice, becoming brilliant and even piercing in the highest tones. The lower register has a hollow, reedy, but richly resonant quality peculiar to itself. It is capable of portraying many qualities of feeling. This lower, or "chalumeau" register is often used in solo passages either alone or in unison with cello or French horn.

Tone is produced by the action of the breath on a bamboo reed clamped lengthwise along the mouthpiece, after the manner of the toy tin horn. The reed, in turn, sets the column of air within the tube in motion, which is the real source of the tone. The pitch is controlled partly by the lips and breath and partly by changing the length of the air column by covering and uncovering the holes along the instrument. When all the holes are covered, the column is longer and the pitch lower than when some or all are uncovered.

While the old, or Albert system of keys is still in extensive use, the Boehm system is much easier of execution and truer in intonation.

Clarinets are built in Bb, A, Eb and C. Those in Bb and A are in universal use while the others are rarely seen. The Bb clarinet has the best tone quality. The A clarinet is used to facilitate playing in difficult keys. With the Boehm system clarinet this plan is no longer necessary, since it is possible to play well in all keys with the improved instruments; but the custom still prevails and when the music is in sharps the clarinet part is written for the A clarinet.

Music for the Bb clarinet is written one step higher than it actually sounds while music for the A clarinet is written one and a half steps higher than it sounds.

THE BASS CLARINET

The bass clarinet is an octave lower than the Bb clarinet and is used occasionally to round out the bass of the wood-wind choir.

The upper tones of this instrument are extremely nasal; but its lower, organ-like tones are valuable for the coloring of certain fine wood-wind passages.

THE BASSOON (Fagotto)

The bassoon, called in Italian the "fagotto" from its resemblance to a bundle of fagots, is the bass of the oboe family. It has a wooden tube nine feet long built in sections and bound together, since it cannot be coiled like an instrument of brass. Aside from the inconveniences found in all members of the oboe group, it is a splendid instrument. It has

a wide range and is capable of a variety of effects. Its upper register is excellent for melodies both singly and in unison with other instruments, and the lower tones make excellent bass. In staccato passages, the effect is somewhat ludicrous; hence it has been called "the clown of the orchestra."

Music for the bassoon is written in the bass or tenor clefs and sounds as written.

THE CONTRA-BASSOON

The contra-bassoon is a huge bassoon with a range an octave lower. It fulfills a function for the wood-winds similar to that performed by the double-bass for the strings.

THE BRASSES

The Cornet or Trumpet, French Horn, Trombone and Tuba.

The brass instruments, as the name implies, are of brass, with or without a thin plating of nickel, silver or gold. In form they are merely a long tube coiled into convenient shape. A mouthpiece at the smaller end fits tightly against the lips. The other end has a flaring bell-like form.

Tone is produced by setting the column of air within the tube in motion by the vibration of the lips. The pitch is controlled by (1) the lips and breath, and (2) by (a) keys—valves or pistons, or (b) sliding tubes. It is a familiar fact that the bugler plays different tones without the use of valves, keys or sliding tubes. This is accomplished by tightening the lips and increasing the breath pressure for the higher tones, and vice versa. Of course only certain tones can be produced in this way. The full scale and sharps and flats can be secured by inserting pieces of tubing which lengthen and consequently lower the pitch of the vibrating column of air.

CORNET OR TRUMPET (Trombe)

The cornet and the modern trumpet resemble each other closely. The chief difference is that the bore of the cornet is more conical than that of the trumpet, the latter being more cylindrical. The tone of the cornet is more mellow and better adapted for solo or parlor playing while that of the trumpet is more piercing and more suitable for martial effects and is therefore more valuable in the orchestra.

Both instruments play the same music and both are built in Bb, but are usually provided with crooks or extra pieces of tubing to be inserted, changing them to A at will. A cornet is also built in Eb which is used in some military bands but which is rapidly falling into disuse because of its shrill, piercing tone quality.

The music for the Bb cornet is written one step higher than it actually sounds. The music for the A cornet is written one and one-half steps higher than it sounds. The music for the Eb cornet is written a step and a half lower than it sounds.

THE FRENCH HORN (Corno)

The French horn (so-called only in America) has a very long tube of small bore curved circularly, with a small mouthpiece and a large flaring bell. It is superior to all other brass instruments in respect to tone color, dynamic variability, and the many kinds of uses to which it may be put. The pitch is controlled largely by the lips, and the player must have a good musical ear. The quickest way to develop horn players in schools is to transfer a

good cornet player to the horn and he will apply his training and lip-muscle development to the new instrument with little difficulty.

The horn is usually built in F and its music is written a perfect fifth higher than it sounds.

THE ALTO HORN

This instrument might be considered an alto cornet, built in Eb. Its tone is trivial and its only use is as a substitute for the French horn in bands. It is very easy to learn.

The music is written a major sixth higher than it actually sounds.

THE MELLOPHONE OR BALLAD HORN

This instrument is an alto horn built in F and changeable by crooks to Eb, D and sometimes C. It is the best substitute for French horn in the orchestra. It is very easy to learn to play, but its tone is not to be compared to that of the French horn.

The mellophone (in F) plays the French horn parts without transposition.

THE BARITONE HORN

The baritone horn is the baritone of the cornet family and serves a very useful purpose in military bands where it fills the same position as the cello in the orchestra. It has a full, round tone that is pleasing in solo passages. It is not used in symphony orchestras because it lacks individual color but it may be used to good advantage in school orchestras as its tone has body and is a fair substitute for missing instruments.

The baritone is built in Bb but the music is written as it sounds, in the bass clef, the player (unconsciously) transposing. The baritone may easily be used in place of any instrument which uses the bass clef.

THE TROMBONE

This instrument has a cylindrical tube about twice the length of the trumpet. There are two overlapping sections, one of which slides over the other in such a way as to enable the player to vary the pitch by lengthening the vibrating column of air.

There are two trombones in general use, the tenor trombone in Bb and the bass trombone, also in Bb. The two instruments are very similar but the bass trombone has a slightly larger bore and an extra crook which lowers the pitch of the entire instrument a perfect fourth when brought into use by the opening of a valve. The small bore of the tenor trombone permits the player to play higher tones, while the large bore and slide permit the bass trombone player to play a full octave lower than the tenor trombone compass.

While both instruments are built in Bb, the players learn the notes as they actually sound and the music is written as it sounds, usually in the bass clef, but occasionally in the tenor clef. Old publications occasionally have a part for the alto trombone, written in the alto clef, which is played on an ordinary trombone.

For the trombone, as with the string instruments, the player must have a true ear. The manipulation of the "slide" is much more difficult than the fingering of three valves. The trombone, like the violin, is a "perfect-toned" instrument; that is, it may be played in tune even though out of tune; and, even though in perfect tune, it may be played out of tune by inaccurate shifting of the slide. For instance, in playing the scale, the first tone might be in tune and the next a third, a quarter, or any fraction of a tone, flat or sharp, by moving the slide too far or not far enough.

THE TENOR HORN AND VALVE TROMBONE

The tenor horn is merely a trombone with valves (pistons) instead of the slide, or a baritone of small bore. It has fallen into disuse in America.

The valve trombone is the same instrument built in the shape of a trombone. It can be used as a substitute for the baritone or trombone, but its tone is nasal and less pleasing.

THE TUBA

The tuba is the bass of the brass choir in the symphony orchestra. Its tone is so heavy that it is not used in smaller orchestras, even in the absence of a string bass, except occasionally for martial music; it is, however, indispensible for a military band.

The tuba is in reality a bass cornet and can be played by a cornet player after a few days practice in adjusting his lips to the large mouthpiece.

Tubas are built in Eb, Bb and C (called "double Bb" and "double C"), the first being the most common and the last named the one used in most symphony orchestras. The double Bb tuba, pitched a perfect fourth below the Eb tuba, is found in nearly all large bands.

INSTRUMENTS OF PERCUSSION

This section of the orchestra is quite important, but too often it has been looked upon as a secondary thing.

The section may roughly be divided into (1) **Tympany** or **Kettle Drums**; (2) **Bass** and **Snare Drums**; (3) **Cymbals**; (4) **Bells, Chimes, Triangle, Tambourine,** and the like, and (5) **Traps.**

Tympani are large copper "kettles". Hence the name "kettle drums". Parchment membranes stretched over the top are held in place by hoops regulated with screws. Their pitch may be raised or lowered several steps by tightening or loosening these screws. The player uses two sticks or hammers, one in each hand, with which he can produce a tremolo closely resembling thunder.

There are usually two kettle drums in an orchestra and occasionally the music calls for three or four. When two drums are used they are usually tuned to **do** and **so** in the key of the piece. When the key changes in the middle of a piece the player must tune the drums to the new key without disturbing the performance, a feat that requires a keen ear.

The tone of the tympani is capable of the widest variation from pianissimo to fortissimo. For a soft staccato bass they are effective, with or without the double-basses of the strings. They may portray any emotion from suppressed excitement to violent agitation.

The **bass drum** consists of two heads of parchment stretched over the ends of a cylinder of wood or metal. The hoops to which these are attached are held in place and adjusted by ropes or screws.

The bass drum is played with a single hammer, the player striking the parchment near one side where the greatest amount of vibration is produced. The music is usually written on C, second space, bass clef.

The **snare** or **side drum** is much smaller than the bass drum. Otherwise it differs only in that gut, woven or spiral wire "snares" are stretched across one head. These are ad-

justable, so that when the player beats on one head the snares vibrate against the other head. The music is usually written on G, fourth space, bass clef, usually on the same staff with the bass drum music.

Cymbals are large plate-shaped disks of brass used either with or without the bass drum to produce a loud clanging tone. They also may be played pianissimo. The music is usually written on the top line or space of the bass staff, generally with some other percussion part, its notes being distinguished from the others by their diamond shape.

Bells as used in the orchestra are not bells at all, but rectangular steel bars vibrating freely upon a frame. They are struck by two small mallets of steel, gutta percha, wood or rubber, according to the effect desired. The music is written on the treble staff and usually sounds an octave higher than written. The range is two and a half octaves.

Chimes are large cylindrical tubes, usually seen suspended vertically from a frome at the rear. They are expensive and cumbersome; hence only one or two to an octave or more as needed will appear upon the stage at one time. Chimes are played with wooden hammers. The music is written as it sounds or one or two octaves higher.

The **triangle** is a small bar of steel a foot or so in length, bent into the shape from which it derives its name. It will be found suspended somewhere near the trap drummer's seat in almost any orchestra. Without definite pitch, it has a light, tinkling tone, slightly sustained, which may be used to outline simple and delicate rhythmic figures. Tone is produced by striking with a light steel bar. The music is usually written on G, space above the staff in the treble clef.

The **tambourine** is a miniature drum with only one head. When it is truck on the hand or shaken, little metal plates jingle on wires within the frame. The music is usually written on C, third space treble clef.

Castanets are small concave pieces of wood or ivory struck together by the thumb and fingers or hung from a third piece with a handle and shaken against it. The tambourine and castanets are characteristic of the nations of southern Europe, and are used mainly in dance or other music to give local color. The music is usually written on C, third space treble clef or on E, third space bass clef.

The **xylophone** is like the bells, except that the bars are made of wood. These may be mounted on a stand with a hollow rosonating tube suspended under each bar. The bells are used in most orchestras, but the xylophone is used more in special acts on the stage. Both of these instruments are capable of rapid execution. The music is written as it sounds in the treble clef.

The term **"traps"** may be applied to various devices used to imitate the sounds of birds, animals, fowls, insects, steamboats, locomotives, guns, storms, church bells and many others. From the saw mill to the telegraph office, from the fire engine to the nightingale there is probably no sound on land or in the air that has not been imitated by the resourceful trap drummer. Artistic they may not be entirely, but truly realistic and always creative of interest.

In all music for percussion instruments with the exception of kettle drums and occasionally bass and snare drums, the notes are supplemented with the name of the instrument which is to play them since no definite arrangement for writing music for these instruments has ever been accepted for general use.

THE SAXOPHONE QUARTETTE

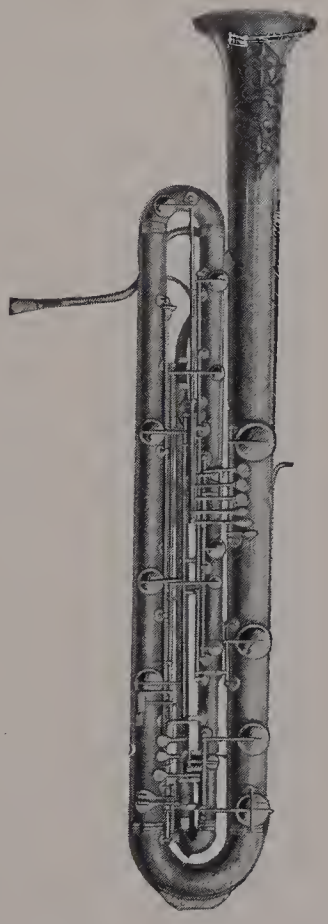
The Saxophone has not been regularly accepted as a member of any family of musical instruments. It is, however, used much in both bands and orchestras and for solo playing. Many modern composers are now writing for Saxophones as accepted parts of the symphonic ensemble with the result that these instruments are occasionally seen in our symphony orchestras.

In form the instrument is a conical brass tube with a curved neck and a turned-up bell. Mouthpiece, reed, tone production, fingering and manner of holding are about as with the clarinet.

The saxophone is a much abused instrument, along with the trombone, because of its adaptability for producing uncanny effects. As with the trombone, the saxophone is capable of producing beautiful music as well as wierd noises. The fact that the saxophone is one of the easiest instruments to master does not mean that a saxophone student can acquire musicianship sooner than the student of any other instrument.

Six sizes are in common use: Soprano, alto, tenor, melody (tenor in C), baritone and bass. In most band music and sometimes in orchestra music, parts are printed for them. If not they may double with other instruments or play the parts of missing instruments. But, though resembling the wood-winds in some respects, they are a distinct class by themselves and are more pleasing when enough are present to form a "section."

THE SARRUSOPHONE



The sarrusophone is the latest addittion t o the family of instruments in use in American bands and orchestras. This instrument i s merely a bassoon made of metal and is much easier to play than the usual bassoon. It is made in various sizes but only one, the bass, has any claim to a place in our musical orga nizations and that principally in our military

bands. It has one advantage over all the wind instruments in that it is capable of great variation in power. In school orchestras it can take the place of the string bass in a measure if well played, although its size and cost are somewhat prohibitive.

THE FRETTED INSTRUMENTS

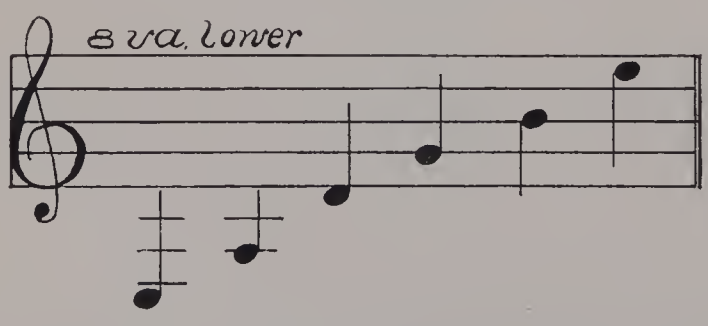
Fretted instruments are stringed instruments on the neck of which strips of metal are placed crosswise at definite intervals to mark the steps and half steps. In this class are included principally the mandolin, guitar, banjo, and ukelele. They have, like other stringed instruments, a hollow wooden body and neck, over which strings are drawn and tightened by pegs or screws in the small end. To change the pitch of a string, the player presses it against the finger board at a point just above the desired fret. The string then vibrates freely between the fret and the bridge. Tone is produced by plucking the strings with the fingers of the right hand, sometimes with the aid of a plectrum or pick of tortoise shell or steel.

Fretted instruments are rarely used in the orchestra, but they have a great history and it is well to have some idea of their exact status in the instrumental world. Instruments of the viol type are a comparatively modern invention, dating back no further than the sixteenth century. But instruments with frets come of a lineage older than history itself. The harp and the flute, or pipe, are often thought to be the oldest; but earliest historical monuments show pictures of string instruments held in the hand and plucked with the fingers.

During the sixteenth and seventeenth centuries an instrument called the **lute,** with from six or eight to twenty or twenty-five strings, was in general use in European countries. It was doubtless the immediate ancestor of present day instruments of this type. It is said to have had a remarkably pleasing tone, lending itself to the performance of elaborate as well as simpler forms of composition. One or more were considered a necessary part of the equipment of every well-to-do household; and up until the the time of the ascendency of the harpsichord and the invention of the pianoforte it occupied the position that the latter instrument now holds. Published compositions for it bear dates as late as 1740.

But it gradually became evident to composers and performers, among whom may have been no less a one than J. S. Bach himself, that the instruments with a keyboard offered greater opportunities to the individual performer, and that the viol quartette was a vastly superior medium for ensemble music. The lute, then, with its "unimaginably tender charm and coloring," but weak, tinkling, unsustained tone, was dethroned; and from it we now have only the guitar and its associates.

The **guitar** has a flat back, rounded sides like the violin, and a long neck; whereas the lute has a pear-shaped body and a short neck. In use, however, the guitar bears more resemblance to the older instrument. It has six strings tuned:



The guitar is used mostly to accompany the human voice, but it may also carry an independent melody and play its own accompaniment at the same time. The upper strings

are picked by the fingers and play the melody or the upper tones of the chord; while the lower strings, plucked by the thumb, sound the bass.

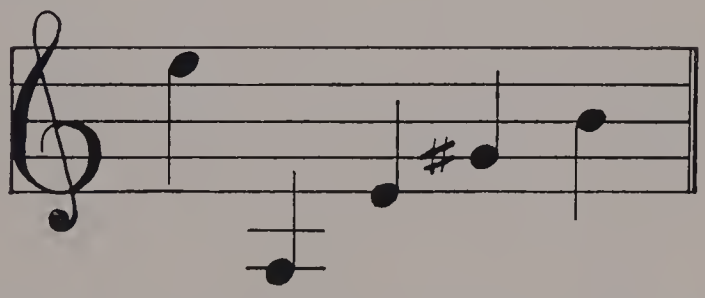
Much good music has been written for the guitar, either as a solo or accompanying instrument.

The **mandolin** bears more resemblance to the lute in appearance, having a rather wide almond shaped body. The type used most in America has four pairs of strings, each pair strung in unison, and tuned exactly as the violin.

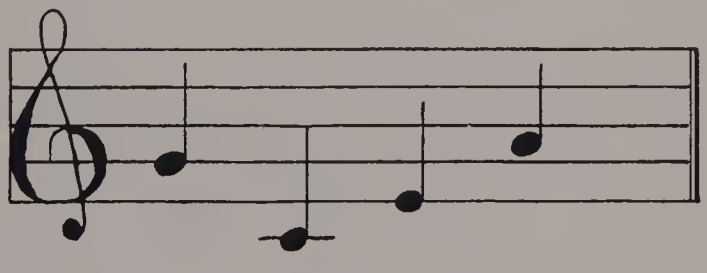
The mandolin is also fingered like the violin, and in the school orchestra is sometimes used on violin parts. Tone is produced by striking the strings with a pick or plectrum, held between the thumb and forefinger. The strings being very short and light, the tone can be sustained only by resorting to the tremolo, or rapid movement of the pick, back and forth across the strings. This, of course, is not necessary for runs or short notes. The mandolin is used mostly as a solo instrument; though it occasionally "chords" for the voice. Many fine selections have been arranged for it, with accompaniment of piano or guitar. The "mandolin club" is a sort of orchestra or glee club in which mandolins and guitars are the principal instruments. Other instruments that may be added are the piano, drums, tambourine, castanets, and other instruments of percussion.

The **banjo** is more directly descended from an instrument which was introduced into western Africa by traders, before the introduction of slavery into America. It is still the favorite of our southern Negroes and their imitators. It has a twangy tone and lends itself readily to rapid and syncopated performance. The body is circular, with a sheepskin membrane stretched over the top like a drum. Its long neck sustains four strings, with a chanterelle or shorter and higher fifth string nearest the thumb.

The tuning is as follows:



The **ukelele** has come to us recently from Hawaii. It is in appearance a very small guitar, with four light strings tuned:



It is incapable of any but the simplest execution, being used entirely to accompany the voice or in "ensemble" with the Hawaiian steel guitar. In reality it is not a musical instrument so much as a sort of musical drum. By means of an instruction book the ukelele is easily self-taught; and perhaps because of its delicate tone and low price, became a sort of fad.

The Hawaiian **steel guitar** is about the same as any guitar, except that in playing it is held flat on the lap and the strings are stopped by a small rounded steel bar moved up

and down the fingerboard. This bar makes the vibration of the strings independent of the frets. Over-sentimental effects may be produced by slowly moving the bar during the production of a sustained tone, causing an exaggerated slur or **portamento.**

The **zither** consists of a flat box which rests on the table. It is strung with from twenty-seven to forty strings, five of which pass over a fretted fingerboard and the rest are for chording. It is the national instrument of Bavaria, Syria and Tyrol. Like the mandolin, it may be used in the orchestra for local color.

Instruments Used in the Symphony Orchestra. **Other Instruments.**

	First Soprano	Second Soprano	First Alto	Second Alto	First Tenor	Second Tenor	First Bass	Second Bass
Strings	Violin	Violin	Violin Viola	Viola	Viola Cello	Viola Cello	Cello	Double-bass
Wood-winds	Piccolo Flute Oboe	Clarinet Oboe	Clarinet English Horn	Clarinet English Horn	English Horn Clarinet Bassoon	Bass Clarinet Bassoon Clarinet	Bassoon	Contra-bassoon Bass Clarinet
Brasses	Trumpet Cornet	Trumpet Cornet	Horn Cornet	Horn Trombone	Horn Trombone	Trombone Horn	Trombone Horn	Tuba Bass Trombone
Percussion Instruments Possessing Pitch	Bells			Chimes	Chimes	Chimes	Tympani	Tympani
Instruments used in band and sometimes in school orchestras	Eb Clarinet Eb Cornet Soprano	Eb Clarinet Eb Cornet Saxophone	Eb Alto Mellophone Alto	Eb Alto Mellophone Saxophone	Eb Alto Mellophone Tenor Horn Tenor	Eb Alto Mellophone Tenor Horn Saxophone	Baritone Baritone	Saxophone
Fretted Instruments	Mandolin	Mandolin Banjo Eukelele	Mandolin Banjo Guitar	Banjo Guitar	Banjo Guitar	Banjo Guitar	Guitar	

	Soprano	Alto	Tenor	Bass
Strings	Violin	Viola	Cello	Double-bass
Brasses	Cornet	Mellophone	Trombone	Tuba
Wood-winds	Flute	Clarinet		Bassoon
Percussion	Drums, Cymbals, Bells, Traps. Etc.			

Simplified Presentation Recommended for Pupils of Grammar Grade

CHAPTER TWO

ORGANIZATION

Organization, as the word is commonly used, presupposes the existence of material which may be organized. Organizing a school orchestra, however, except where orchestra work has previously been carried on, goes back further than that. It takes up the problem of **finding the material** for organization.

Following is a detailed outline of the various steps in the solution of the problem.

I

Announce to the school your intention of organizing an orchestra. Ask all interested to meet you at a given time and place. Talk it over with them, arouse their enthusiasm and enlist their co-operation.

II

Give an illustrated talk before the pupils on the instruments of the orchestra. Talk to about fifty pupils at a time. Two or three grades may assemble in one class room. Do not use an auditorium or hall, as there you will not receive the thoughtful attention of the class room. The auditorium is associated more with the idea of mere entertainment.

Say to them as follows:

How many sing soprano? Alto? Tenor? Bass? Now the instruments of the orchestra are just like that. (Write on the board **soprano, alto, tenor, bass.**) In the orchestra we have also stringed instruments, brass instruments, wood-wind instruments, and instruments of percussion, or drums. (Write on the board **strings, brass, wood-wind, percussion,** in a vertical column at left). (See chart). Who knows what the soprano stringed instrument is? Why, the **violin,** of course. (Write it down.) Who knows what the tenor string instrument is? Someone will probably be able to give the answer **cello.** Not "sello", and not "shello", but "chello". All say it! Who knows what the cello looks like? Why, of course —the great big violin that the player holds between his knees. Who knows what the bass string instrument is? Yes, the bass viol, or the **double bass** as it is called. Next, show them pictures of the instruments, and also display as many of the instruments themselves as are available. In like manner let the pupils assist you in putting down the names in order of the brass and wood-wind instruments. Explain that the oboe, bassoon and French horn will not be wanted for the present as they are rather difficult instruments for young players. Next state that beginners on the stringed instruments and on the trombone must have a true musical ear; that boys or girls of good size may doubtless be required for bass instruments, and that those who have played the piano will have an advantage in learning to play a keyed instrument such as the clarinet because their fingers are accustomed to keys. However, anyone who is really interested and really wants to play may take up any instrument, even though he has not played the piano and even though he may not think that he has a good musical ear, for taking music lessons develops a musical ear. Next, explain that each pupil is to buy his own instrument (unless the school is to furnish some of them) and to take private lessons from some teacher (unless they are to be taught in school). Make this talk in the hearing of ALL pupils from the third or the fourth grade through the high school. Do not under any circumstances be content to talk only to those few who "would be interested" in the organization of an orchestra, or to the boys only. The girls make good orchestra players, and very often the cleverest boys will not permit it to be thought by their fellows that they are interested until it becomes the popular thing. The brightest boys and girls make the best players, as orchestra work requires alertness and other points indicative of good mentality.

The main object of this talk is to give the pupils some definite knowledge of the in-

struments upon which to base their interest. The lesson will be made more vivid and practical by the use of some of the following means of illustration:

1. A complete set of large, colored pictures of the instruments.

2. A number of real instruments, to be performed upon by local musicians.

3. Phonograph records illustrating characteristic sounds and passages, as played by the respective instruments.

4. Pictures of the instruments clipped from a catalog and mounted on cardboard.

Familiarize yourself with the prices of the instruments, such as can be purchased both new and second-hand in your locality; and if the local supply is limited, secure a catalog of new and used instruments from some of the larger city dealers. Acquaint yourself also with the names and addresses of available private teachers.

This exercise should require from twenty-five to thirty-five minutes. At the close ask every pupil to write on a slip of paper which has been previously handed him, his name, grade, address, telephone number, the name of any instrument he owns or can secure and the amount of training, if any, that he has had. Ask all who have not taken music lessons to write down the name of the instrument **which interests them most.** Insist upon every pupil present writing down the name of SOME instrument, and stating whether or not he would like to be able to acquire it and join the orchestra. Collect these slips and dismiss the pupils.

III

Go over the slips and discard those which show plainly that the pupil has not been greatly impressed. From the remainder select any: (1) who have an orchestral instrument and can play it; (2) who may have access to an instrument but do not know how to play it as yet; (3) who you believe might be persuaded to acquire an instrument and learn to play it.

Then begin your personal work. Follow them up and talk it over with their parents. Surround the whole process with an atmosphere of pleasure and yet not one of frivolity. It is a change from the regular order of class room activity, and yet it must be systematic and business-like.

IV

Begin instruction on the instruments as soon as you have sufficient numbers. This may be done by:

(a) Each pupil taking individual lessons of a private teacher at his own expense.

(b) The supervisor or leader coaching the pupils singly and in groups, informally.

(c) Instruction by the modern class method at public expense or by the pupils sharing the cost. This is an innovation in music pedagogy, and it is one of the most hopeful signs of progress.

The carrying out of an efficient plan of instruction is essential to the success of the whole scheme. Perhaps more fail here than on any other point, unless it be the proper method of presentation described above under (II).

The class method is recommended as being the most logical and efficient in every way. It may, of course, be used exclusively, or in addition to either or both of the other methods.

To advertise and carry on instrumental classes requires a good deal of time and effort. They often will not thrive until the whole community knows of them and they become "fashionable." The following plan may be found helpful.

Cards like the one which is reproduced below should be printed in sufficient numbers so that each child who is eligible to the classes may take one home to keep or return as the case may be. The wording, of course, will be varied to fit the local conditions as to

size of classes and whether free or paid by the pupils. (This is a copy of the card used in the Minneapolis schools).

(Front of Card)

INSTRUMENTAL AND VOCAL CLASSES

To the Patrons of the Schools:

An opportunity is offered the pupils of the public schools to learn to play the piano or any orchestral instrument in classes conducted by excellent teachers at a nominal fee. Voice culture is also offered to eighth grade and high school pupils.

The fee for each lesson is fifteen cents where the maximum number of sixteen is enrolled. When the class numbers less than sixteen, the fee per pupil is increased proportionately, as the teacher must be paid for a full class no matter how many pupils are enrolled.

Payment must be made in advance for a term of ten lessons.

Pupils will buy the music required.

Pupils of the third grade and up will be received into these classes.

The classes will be graded according to ability.

Pupils who have studied with a professional private teacher within a year will not be received into these classes as the public schools have no desire to interfere with the private teacher's work.

The parent or guardian should sign on the opposite side and return this card to the principal of the school if the pupil desires to enter the class.

(Signed).....
Supervisor of Music.

(Back of Card)

I wish to have..... take
(Name of Pupil)

..... lessons on the terms indicated on this
(Instrument)
card.

Signature .....
(Parent or Guardian)

Telephone..... Address .....

Date....., 19.....

With these cards in hand, the supervisor or teacher calls two or three classes together and talks to them about as follows:

"All those who have a piano, organ or melodeon in your house or in some neighbor's house where you could play on it if you wished, stand."

"All those who are NOW taking lessons, sit." "Each one left standing, take one of these cards and sit."

"We will not talk about the piano, organ or melodeon any more."

"One at a time, stand, and tell the name of any other instrument you know about." (Pupils name all they know and the teacher supplements).

"All of you who have one of these instruments in your house or in some neighbor's house that you might borrow, stand."

"All who are NOW taking lessons on one of these instruments, step forward." (Teacher takes names of these and name of instrument each plays).

"Those who play and are not NOW taking lessons take one of the cards."

The teacher should also take the names of all pupils who have instruments at home or in the home of a neighbor where they might be borrowed, with the names of the instruments, even though these pupils do not play at all. These pupils should be given cards also. By this plan, all the data about instruments owned or known of in the neighborhood will be secured and every pupil and parent will know about the classes. When the entire school has been canvassed, the organization of the players into classes and orchestra can be made at once. Others also can be induced to secure instruments and begin.

This whole process should be repeated each year in order to insure continuity and to give the new and younger pupils an equal opportunity.

Detailed instructions for carrying on the classes are given in the next chapter.

Assemble your players as an orchestra as soon as you have four or five who can play music of the difficulty of the average hymn in time and tune. Ensemble at this stage of advancement is not harmful, but a needed part of every pupil's training. It teaches him thus early to keep time and to listen to more than one part.

Receive the instruments as they present themselves, regardless of the order in which they are available. Begin with violins only if that is all that can be had. The following combinations, however, are most acceptable:

1. Violin, cornet, drums, and piano.

2. First violin, cello, cornet, drums and piano.

3. First and second violin, cello, first and second cornet, flute, clarinet, drum, piano.

4. First and second violin, viola, cello, bass, cornet, trombone, flute, clarinet, drums and piano. This combination is known to leaders and dealers as the "small orchestra." So specify when ordering music for this combination.

5. Same as the above, with the addition of second cornet, second clarinet, and first and second horns. This is known to the profession and trade as a fourteen part orchestra.

6. Same as (5) with the addition of oboe, bassoon, tympani, etc., etc. This is called the full orchestra.

A small orchestra (4) may of course be larger than a full orchestra in point of numbers, as there is no definite limit to the number that may play on any one part.

If the assembled orchestra numbers six or less, let them sit in a semi-circle, facing the audience, with the leader standing in front of the center, his back toward the audience. The small instruments will be at the leader's left, the large at his right, while the piano and drums occupy the center. With a larger number, let them follow the general idea of the seating of the symphony orchestra (see chart), making allowances for the possible differences as to numbers, space for seating, etc.

Where more than two players play the same music, provide a copy for every two. Do not permit three or four to group around one music stand, all trying to read from the same copy. Bear this in mind when ordering music. For instance, if your orchestra contains five first violinists, it will be necessary to provide four first violin parts: one for each pair of players and one for the conductor's part.

The problem of finding suitable music is one of the greatest which the leader has to solve. In many cases he will be thrown upon his own resources and perhaps have to burn the midnight electricity making simple arrangements from tuneful songs or instrumental pieces. This procedure may seem laborious to some, but it is recommended as highly efficacious, as it is the only way the player who has studied five years can have an interesting part, while at the same time the one beside him who has only studied five weeks can have a possible part.

Avoid "afterbeats" for the second violins and violas. Let these instruments have a smooth harmonious or melodious part like the alto or tenor in a vocal composition. This will not only hold the interest of the players, but will tend to promote better playing as it permits them to sustain their tones long enough to hear whether they are in tune or not and to secure a better blending of the tone of the different instruments.

VI

The rehearsal should be in a suitable music room in the school building, during the regular school recitation period of from forty-five to sixty minutes. Two to four rehearsals per week should be held, allowing pro rata credit for laboratory hours of practice. Where the pupil is taking outside lessons of an approved teacher and reporting his practice and progress on regular printed blanks provided for the purpose, signed by teacher and parent, he should receive credit as for any regular full study.

Instead of four rehearsals per week, an ideal plan would be to have two of double length after the plan of manual training or other laboratory work, and for the same reasons. The time spent in putting all things in readiness is fully as great on part of both pupil and teacher, and it is often just as impractical to stop at the ringing of the bell marking the close of the first short period of rehearsal.

Music racks should be owned and provided by the school. They should be of a substantial, non-portable, non-collapsible type. The desk top should be wide and solid, not of strips with holes to let the music fall through. The standard and base may be of wood or iron, heavy enough to prevent being easily knocked over. A gas pipe standard, set in a base of concrete, with a top of sheet metal or iron, heavy enough to prevent being easily knocked over, makes an inexpensive and durable rack.

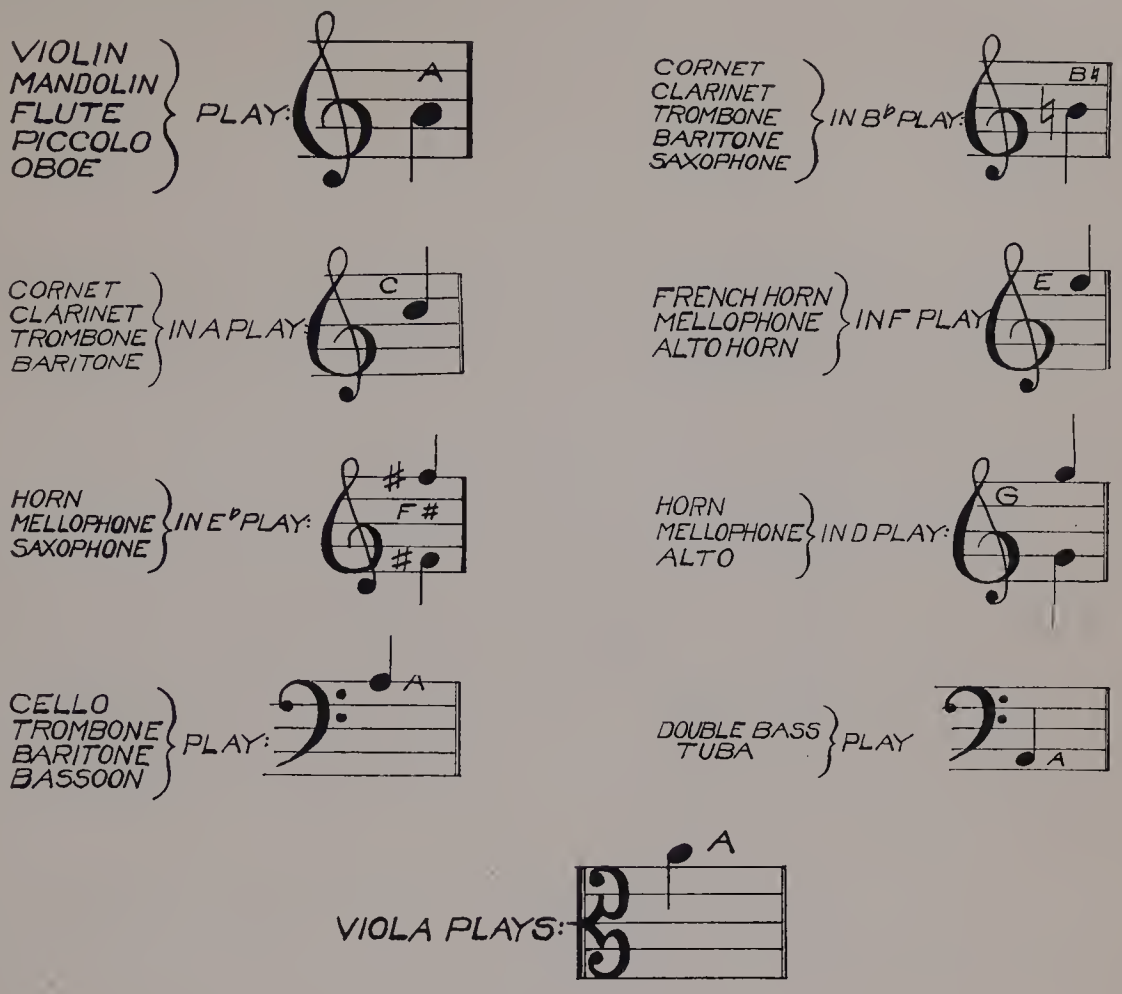
Plan each rehearsal carefully in advance. Have chairs, racks, music, and all other details arranged before pupils appear. The names of pieces to be rehearsed, in order, as well as any announcements to be made, should be placed upon a blackboard. Allow no one to "toot" or practice individually before the rehearsal begins or during pauses for special directions.

For tuning, first let all pupils be seated in their places. With beginners, each instrument must be tuned alone at the beginning of the rehearsal, and perhaps again at intervals during the hour. The director, with such assistants as he may be able to appoint, will have to do this himself, or at least closely supervise.

Have the players tune their own instruments as soon as they can do so without undue loss of time. First let individuals, then groups, such as the first violin section, learn to tune together; then all the strings; and so on until the whole orchestra can tune simultaneously.

For this the piano or oboe sounds A, to which the strings tune their A, and their other strings from this string. Wind instruments sound A or the tone corresponding to

A and adjust tuning slides accordingly. The notes which the various instruments sound to correspond to A are as follows:



Tuning the Orchestra.

With an orchestra of moderate ability it is well to use the brass band method of tuning the wind instruments in place of or in addition to the above. See page 96.

As soon as practicable, appoint or elect by popular vote pupils who shall be responsible for the following offices and duties: (1) a secretary, to keep a record of the attendance and notify absentees of important announcements. He should have a book in which is kept the roll, daily program, address and phone number of each member for emergency use; (2) a librarian, to pass out the music before, and collect it after, the rehearsal; to keep all music systematically filed and be responsible for it; (3) an assistant conductor; (4) a president; and such other officers as conditions seem to require. In most cases it will be well to create an office called the sergeant-at-arms, whose function will be to see that the temperature, lighting, ventilation, and other physical conditions of the classroom, such as cleanliness and orderliness, are conducive to the comfort and efficiency of the class; also to answer knocks at the door and guard against interruptions.

When not in use the music should be kept in heavy paper folders bearing on the outside the title, composer, and number and names of parts contained. Several folders may be inserted in a substantial pasteboard box or covered shelf after the plan followed by the best music stores. Music preserved in this way is not worn by constant fingering and is kept from dust and light, and will last for years.

While the music is in actual use, have a special folder for each player or pair of players containing the parts intended for his or their use. An envelope may be used instead of a folder, which is a better protection against parts losing out, but is not quite so convenient. The best method is the loose-leaf music folio. This is somewhat expensive but very dur-

able and will prolong the life of the music, especially if it is to be taken home by the pupils for practice. Each piece is pasted to a strip of canvas or similar material which is securely held in the folder after the manner of the commercial loose-leaf ledger. Folios especially made for orchestra music, any size, may be purchased from most publishers of orchestral music.

Do not call the rehearsal to order by rapping noisily with the baton. The incompatibility of this procedure with good discipline and good pedagogy is surely apparent. Rather teach the pupils instantly to be alert on sight of the uplifted baton.

Do not stop or wait for late comers. Let them tune up and find their places as best they can. Allow no interruptions of any kind, and admit no visitors except by pre-arrangement.

Begin with a familiar selection; then new music; then partly finished music; then something of a lighter character, and familiar, in conclusion. Do not stop for slight mistakes. Do not talk a great deal, if any. Keep the wheels of the rehearsal machinery moving. When they stop, nothing is being accomplished.

Do not feel that the leader must always be at his place, baton in hand. The players should be able to keep together without the leader, if necessary. Let him occasionally move among them, more closely to observe the progress of this one, and to give that one a bit of encouragement; or go to the other end of the hall to observe the balance of parts and the general effect. Once in a while, but not too often, he will pick up an instrument and play for a few bars. Train one of the older members to act as assistant or student conductor. He may be used in emergency, and in any event the practice will do him good and stimulate the ambition of other capable players.

Let the seconds play first on certain stated selections, but not enough to abolish the two ranks and the desire for promotion or the danger of being put back.

The following rules for orchestra were formulated by the members of the Richmond (Ind.) High School Orchestra, adopted unanimously and have governed the orchestra for a year.

RICHMOND HIGH SCHOOL ORCHESTRA RULES

1. Order is Heaven's first law. It applies especially to orchestra practice.
2. (a) Every member must be in his place when the five-minute bell rings.
   (b) Take places quietly. Warm up in perfect silence.
3. (a) When the bell rings the concert master rises, takes the A from the oboe. This is the signal for principals of each string section to rise, take the A and tune their sections. Wind players arrange their music according to program on blackboard while strings are tuning. All strings tune at the same time and stop as soon as they are in tune and give the winds a chance.
   (b) When strings have tuned, concertmaster sits, which is the signal for first oboe player to rise, tune the wood-winds, then remain standing while the horns and brasses tune. String players arrange their music while the wind instruments are being tuned. When oboist sits the conductor rises and the rehearsal begins without a word.
4. (a) Watch position of instruments while playing.
   (b) Sit with both feet on the floor.
   (c) All players must have uniform resting position for instruments. It is the duty of the efficiency manager to report all cases of poor position and disorderly conduct. (See note).
5. (a) Do not notice mistakes of others in rehearsal or concert.
   (b) No visiting or practicing during rehearsal or concert. Reason: An ear that is not delicate enough to dislike other sounds during music will never make a first-class musician.

6. Anyone wishing to speak during rehearsal must rise and address the presiding officer or conductor.
7. (a) All eyes on the conductor.
   (b) Stop playing instantly when you hear three taps or when the batons stops.
   (c) Instruments in position ready to play when you hear two taps or when the conductor raises his baton or when he speaks.
8. Between pieces:
   (a) Get next piece ready.
   (b) Tune quietly if necessary.
   (c) Be ready to start on signal.
9. Failure to comply with the above rules will be punished by suspension from the orchestra. Readmittance will be granted only by written order from the principal.
10. (a) Auditorium shall be closed to everyone except members of the A orchestra during sectional rehearsals.
    (b) Parents and teachers may visit sectional rehearsals by permission only. Listeners are admitted to all other rehearsals provided they are perfectly quiet.
    (c) Players are admitted by examination only. All members must take at least one lesson a week and practice six hours weekly outside of class.

Attendance is taken daily by secretary during rehearsal. Secretary collects excuses and grants passes.

All bowings and phrasings must be marked by the third day after the first reading. Principals of sections are held responsible for their sections in marking and in conduct.

Tryouts are held every two weeks at which time promotions are made in accordance with ability shown.

N. B.—The orchestra is organized with a President, Secretary, Librarian and Assistant Librarian. Librarian takes care of the music. Assistant places books and music before rehearsals and concerts.

Efficiency officer is appointed by conductor.

All smaller instrument cases must be under chairs of players.

VII

A practical and economical form of baton is eighteen inches in length by five-sixteenths in diameter, made of white birch and finished in the natural wood. These may be turned out by the dozen at small cost in the manual training department. A lighter baton which tapers to a diameter of about an eighth of an inch at the smaller end may be preferable, though less durable.

Grasp the baton lightly between the thumb and first two fingers of the right hand. Balance it so that its weight holds the larger end up against the hollow of the palm. Let the other fingers fall upon it naturally.

Extend the arm to its full length, pointing the baton straight forward. Bring it down with a vigorous motion to the level of the waist line; swing the arm and point the baton to the left as far as possible; with a wide sweeping movement bring the arm around and point the baton to the right, extending the arm even with the shoulder to its full length; lastly swing it inward and upward to its original position. Practice before a large mirror to insure correct and graceful movement. Do this both with and without accompaniment of piano or phonograph in slow four-quarter time, then more rapidly and with less shoulder movement.

Each measure in "common" time begins with the downward stroke and the order "one, two, three, four" is invariably indicated by the **down, left, right, up** of the baton. In three-quarter time follow the order **down, right up**; in two-quarter or two-half time, **down, up**; in rapid six-eighth time **down, up** on the first and fourth counts, respectively; in moderate six-eighth time **down, down, down, up, up, up**; in very slow six-eighth time, **down, down, left, right, up, up**; in moderate and rapid twelve-eighth time, **down, left, right,**

up on the first, fourth, seventh and tenth counts respectively; in nine-eighth time, **down, right, up** on the first, fourth and seventh counts respectively. In rapid four-quarter or "cut'(¢) time, beat **down, up** after the manner of two-quarter time. In rapid waltz time beat **down** only for each measure, on "one."

For selection in slow tempo and majestic style, swing the baton with the shoulder, or whole arm movement; for those of a brisk or martial nature use mainly fore-arm or elbow movement; and for those of a light tripping character, let the wrist movement predominate. At no time must wrist, elbow or shoulder be rigid.

The left hand may be used for emphasis, to duplicate the motions of the right; to indicate a long sustained tone by the fore-finger; to indicate a diminuendo or pianissimo by a suppressive gesture; and to give a player or group of players their cue. Except when actually needed, the left hand and arm should hang naturally at the side.

Signal for attention when ready to play by extending both arms outward and a little upward. Give a further preparatory signal by a motion in the direction of the beat preceding that on which the selection begins. Thus if a selection in four-quarter time begins on the last count of the measure, beat **right, up** in the desired tempo, the players entering on **up.** It is both unnecessary and unmusicianly to beat an entire preceding measure.

In marked ritards or other sudden changes of tempo, where the beat is divided, indicate each eighth or sixteenth note, if necessary, by repeated movements of the baton in the direction corresponding to that part of the measure in which the note belongs. For example, if a ritard occurs on the third and fourth counts of a measure of eighth notes in four-quarter time, beat **down, left, right-right, up-up.**

When accompanying a soloist with orchestra, give him the cues by a glance only. When accompanying a chorus, as in operetta or cantata, it may be necessary to give a vigorous and unmistakable nod or gesture at the proper time of attack.

Every performer must at all times be stationed so as easily to observe the leader and his baton, and must be trained to follow it instinctively. Arrange each one so that a string stretched from between his eyes to the baton would pass just over the center of his music rack. In beating time, sometimes introduce unexpected and arbitrary changes of tempo, varying every half measure for several measures at a time. This will forcefully call attention to the necessity of observing the baton.

The foregoing suggestions on beating time are statements of conventional rules, followed, for the most part, by the best conductors. However, mere correct mechanical use of the baton will not suffice to indicate or secure true musical feeling or artistic interpretation. The facial expression and whole manner of the conductor should be able to tell the players what his wishes are in language more eloquent than spoken words.

Two or three times a year give a very short instructive and inspirational talk on tone, technic, music, musicians, etc., illustrated by phonograph records.

Read books and magazines on the violin, school music, orchestras, and music in general. Enthusiasm in the teacher, founded on an interest in and a growing knowledge of the subject, will be felt by the pupils without effort. Magazines that will be found especially good are "Musical America," "The Violinist," "School Music," and others. Interesting books on the symphony orchestra are "The Orchestral Instruments and What They Do," by Mason; "The Orchestra and Orchestral Music," by Henderson; and "The Orchestral Instruments and Their Use," by Elson.

CHAPTER THREE

TEACHING BEGINNERS

This is one of the most important phases of the work. For whether orchestral work has been done before in the community or not, pupils as they become proficient graduate and pass on, making the problem of handling beginners an ever present one. Teaching an advanced pupil may require the greatest knowledge of subject matter, but teaching a beginner demands sound psychology and the most advanced pedagogy.

Any one with a knowledge of the fundamentals of music and the instinct of the true teacher can teach beginners on any instrument. In fact he may do it more efficiently than a special teacher of that instrument. This is because the latter often spends much time with minor details to the exclusion of things more essential to the interest and progress of the beginner.

Children dislike practice. They learn to do best by doing. Sometimes a child can be compelled to sit at the piano and while away the bright sunny hours in humdrum routine through a sense of filial duty; but with many, especially most boys, that is impossible. Hence there are few men who can play the piano well. If a boy had to spend his first summer with a ball in repeatedly placing his fingers around it and removing them in a scientific manner; or if his first season in a bathing suit were spent lying prone upon the pier practicing strokes, there would be fewer baseball players and fewer men swimmers. A boy learns to throw a ball by throwing it, to swim by swimming, and to play a musical instrument by playing it. True, the professional ball player, the expert swimmer and the musical artist all have their scientific system of technical exercises, but that is quite another story. No child should ever be asked to take "exercises" as a painful **prelude** to his musical education. Their effect is only to dwarf his interest and retard if not permanently to check his progress. The place for exercises is a little later on, when he needs them and knows that he needs them. Then he will practice them with tenfold more enjoyment and profit. And he will know that he needs them if he is brought to approach them in the right manner.

In the days of ancient Athens, literary as well as other subjects were taught mainly in private lessons. Nowadays the teacher who can not teach an academic subject efficiently in a class of twenty-five or thirty, is classed as a failure. The music supervisor, too, has learned to teach singing in classes, and has been doing it for a century.

But the fact that instrumental music can be taught efficiently, economically and well in large classes has at least been established also. Some skeptics still ask, "Does any permanent good come from it?" The answer is that as much good comes from it as from the teaching of any language or science in classes. The student in French does not become a linguist, nor the student of geometry an engineer, from a little elementary instruction in a class. But, after having had his interest awakened and the foundation laid, he may pursue his studies further. So in the violin, the cornet, or the piano class, the talent is discovered and a beginning is made. The fact that at the end of the year some or even most of the members of such a class discontinue is no discouraging argument. How many school children care to study geometry more than a year?

Every child interested in a musical education should be given the opportunity to try it out in the public schools and at public expense, as in the case of any other academic or vocational subject. Not only should instruction be free, but it would be ideal if the instruments, music, and all accessories could be provided as in the manual training, commercial, or any other well organized department in a modern school.

The following combinations of instruments in classes are most frequently met, twelve to sixteen or more in a class:

(1) Violins.

(2) Pianists.

(3) Violins with other string instruments.

(4) Brass instruments.

(5) Wood-wind instruments.

(6) Brass and wood-wind instruments.

Under ordinary conditions it is perhaps desirable that each player have his own instrument, though not always possible, especially in the case of the piano class.

The classes may be taught by the supervisor of music, the orchestral leader, or by a professional teacher engaged from the community, provided he or she is one who understands handling children in groups. For the piano and violin classes a piano teacher or violin teacher who has been also a school teacher will be best. For the brass and wind instrument classes a local band man will no doubt be successful.

Teaching an instrumental class is the same as teaching one pupil, so far as the general outline to be followed is concerned; and the same as teaching any other subject so far as the administration of the class is concerned. They play together a part of the time and individually a part of the time. In the piano classes one, two or more pianos may be used. The pupils take turns. While not at the instrument each has a printed keyboard and copy of the music before him at his desk, and goes through the motions of playing the notes. Emphasize the importance of the time. The rhythm must be kept even, no matter how many wrong tones are sounded.

The "Universal Teacher" for orchestra and band instruments for class and private lessons, by J. E. Maddy and T. P. Giddings, is recommended. This unique plan places beginners on all the stringed instruments in one class and beginners on all the wind instruments, both wood and brass, in another. These classes are kept separate for a time and then combined as an orchestra. At this time the percussion instruments are introduced and taught.

Such a plan reduces to a minimum the time it takes a pupil to acquire a working knowledge of his instrument. He has the advantage of sound pedagogy, as he begins playing simple familiar tunes and learns the facts about his instrument by experience as he needs them. The pupil learns his instrument at the start both as a melody playing and as an accompanying instrument. This does away at the beginning with the idea that one instrument is more important than another.

He early learns all the positions, fingerings and keys and thus lays a well arranged and usable technical foundation. It is using the same faculty that enables a child to learn several languages at the same time if he is allowed to use them and is not compelled merely to talk about them.

This course keeps up the interest of the pupil by allowing him to play **music** instead of exercises. It lets him play with others, and, by the peculiar arrangement of the music in this course, he is able to make harmony with other instruments very early; thus at once satisfying his musical sense in all three of its phases: rhythm, melody and harmony.

The "Universal Teacher" is urged as a boon to the private teacher. It solves many of his problems, especially that of getting the pupil to practice; for several pupils can be induced to practice together between lessons. The old fallacy that pupils must first learn to play alone and then learn ensemble playing is here effectually disproven. We do not learn to walk or crawl on one limb at a time before calling in the assistance of the others!

For the piano, as with other instruments, the first work should be with familiar melodies, not scales or exercises, and with little attention to fingering or other technic, until the pupil can see the need of it. The first readings may be from the same book which the pupils are using in the singing classes in the grades. A conscientious trial of this plan will doubless prove convincing.

"Giddings' Public School Class Method for the Piano" is recommended. The teacher's manual tells exactly how to carry on the classes, besides giving many valuable hints on teaching which can be applied to all sorts of musical instruction. The various "Piano Class Readers" of the Giddings series furnish material for the classes. This course is published by Oliver Ditson Company, Boston.

Classes should be conducted in a sound-proof music room, during school hours, at public expense; or they may be conducted out of school hours; or the expense may be shared equally by all the pupils, making the cost only nominal to each one.

We will now consider the following outline as applied to the different instruments; taking in order the members of the string, wood-wind, brass and percussion groups:

I. Equipment and care of the instrument.

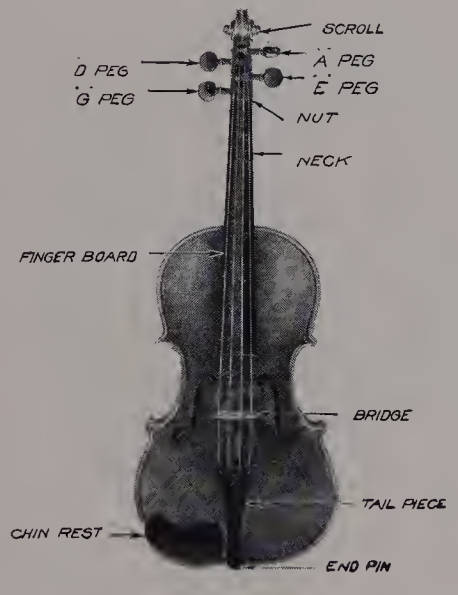
II. How to hold the instrument.

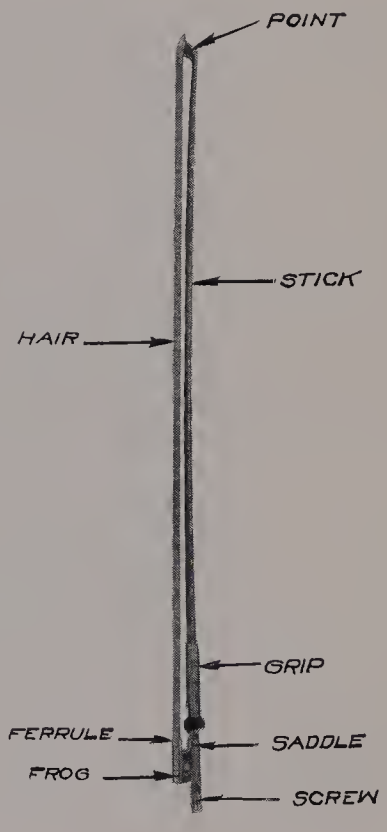
III. How to produce a tone.

IV. How to tune the instrument.

V. How to vary the pitch.

THE VIOLIN





VIOLIN BOW

I. Equipment and Care of the Instrument.

Violins are made in whole, three-quarter, one-half, and one-quarter sizes. For average sized children the following equipment is suggested: Age six and under, one-quarter size; age seven and eight, one-half size; age nine and ten and eleven, three-quarter size; over

eleven, full size. Children should use as large a violin as they can handle as the tone of the smaller instruments is weak. The bow should be just long enough to reach the finger-tips when extended outward from the arm-pit.

The violin is a very delicate instrument and requires careful treatment to preserve it from damage.

The body of the violin is a box made of many small pieces of wood glued together. If left in a hot or damp place the glue will either crack or melt and the instrument will fall apart. The strings are likely to stretch and break if exposed to dampness.

The violin should be kept in its case whenever it is not in use. The strings should not be loosened when not in use for that will increase the difficulty of keeping them in tune.

The pegs should be well fitted so they will not slip and even then it is sometimes necessary to treat them with a mixture of soap and chalk or with powdered resin, to keep them from sticking or slipping. The Becker non-slip pegs are recommended to the student as they will insure easy tuning without danger of slipping or sticking. The steel E string and the patent tuner for the same are also recommended. Indeed this equipment should be made obligatory for all class students as the time saved in ease of tuning repays the outlay many times over and makes easy one of the hardest and most important things a pupil has to learn, that of tuning his instrument and keeping it in tune. By removing or reducing his troubles to the minimum in the beginning much more rapid progress is possible with resulting increased interest and pleasure in his work.

To put on a new string, first tie a knot in one end and catch the knot through the slit in the tail piece. Then run the other end of the string through the hole in the peg, drawing the string taut. Next pass the end of the string under the string in front of the peg and wrap the end once around the string so that when the peg is turned the end of the string will be drawn over the peg under the main part of the string thus preventing it from slipping. Be sure that the string is taut before beginning to turn the peg, for too much slack will fill the peg box or bind against the sides causing the peg to stick.

The bow hair should always be loosened when not in use for, if left tight, it will soon warp the bow stick and ruin it. The bow should never be tightened more than to a point where the hair will touch the stick when playing loudly. The hair of the bow should never be touched with the fingers for this will make the hair oily and the resin will not stick to it. If the hair becomes greasy, wash it in a mild tepid solution of soap and water after loosening the hair but not removing it from the frog; rinse thoroughly, and dry before applying resin.

The bow hair should be resined before each practice by rubbing the resin cake over the hair ten or fifteen times. There is little danger of getting too much resin and most students use too little which causes the tone to sound squeaky or wheezy.

The bow should be provided with a grip or guard, preferably of rubber or leather, covering the stick for about four inches beginning a half inch from the frog when the bow is tightened for playing. This prevents the hand from sliding away from the frog when playing and allows a much more flexible hold on the bow. All professional violinists use this grip or guard. Violin pupils should always use a guard so that they may learn to hold the bow flexibly from the beginning and have nothing to unlearn later.

Equipment List for Violin Students.

Violin.
Bow.
Case, of wood, leather or waterproof composition.
Cake of resin.
Chin-rest.
Shoulder pad (Poehland or equivalent).

Wire E string with patent tuning attachment.

Gut A and D strings.

Gut G string, wound, preferably with silver.

Becker non-slip pegs.

If there is no piano in the home a pitch pipe is necessary.

An extra set of strings and an extra fitted bridge will save an occasional lesson that would otherwise be missed through breakage.

II. How to Hold the Violin.

The violin is held level, its weight resting on the left collar bone and shoulder pad, where it is held by the pressure of the lower jaw on the chin rest.

The Violin.

Every violin student must provide himself with a shoulder pad. The patented Poehland shoulder pad or its equivalent is recommended. It is almost impossible to hold the violin properly and firmly without a shoulder pad. Forcing the shoulder upward in the endeavor to do this is not only very fatiguing but will very soon produce a deformity of the left shoulder. Professional players use both the chin rest and the shoulder pad. Students often try to get along without either, thus making their work difficult and ineffective.

The neck of the violin must rest on the ball of the thumb between the end of the thumb and the first joint and must never fall below the first joint of the thumb. At the same time the side of the neck piece must be against the hand just below the base of the first finger. This keeps the violin neck in its position on the ball of the thumb. The neck of the violin should never be allowed to fall into the hollow between the thumb and the hand. Keep the left wrist straight. Do not let it bend so the palm of the hand touches the neck of the instrument. The position of the hand is difficult to describe but careful study of the pictures will make it clear.

Sliding the thumb along the neck of the violin without allowing the neck to fall into the bottom of the space between the thumb and the hand is awkward for beignners, but it is very important that this correct position be learned at the very beginning, for the following reason:

The free movement of the left hand required when playing in the different positions is only possible when the neck of the violin is held as described and pictured above. Playing in the first position is easy when the neck of the instrument slips clear down into the hollow between the thumb and the hand, and teachers who allow a pupil to play in the first position for a long period at the beginning are very much inclined to overlook the proper holding of the instrument, for the simple reason that it is not absolutely necessary; then when a pupil begins to play in other positions the manner of holding the instrument must be corrected. Improper holding of the instrument which must later be corrected, is the most frequent criticism directed at class instruction by private teachers, and no doubt justly so.

Our experience has shown that a pupil can learn to play in several positions in the beginning as well, or better, than in the first position only, and it is much easier than learning the positions one at a time. Learning to play in several positions at once, furthermore, makes clear to him the necessity of holding his instrument in the only correct way and enables him to lay the foundation of a perfect and well rounded technic, with no bad habits to be unlearned.

The fingers must be held high enough to enable the tips to fall perpendicularly upon the strings.

How to Hold the Bow.

Grasp the middle of the stick with the left hand being careful not to touch the hair.

Place the right thumb next to the frog so that the tip of the thumb nail touches the wood and the back of the thumb touches the hair just where it enters the metal of the ferrule, with the thumb joint bent slightly outward. Next, place the two middle fingers on the stick opposite the thumb so that the creases of the outer joints touch the wood. (See cut).

The following class drill is recommended until the correct position of instrument and bow becomes a habit.

Position Drill for String Class.

"ATTENTION"—

Violin or viola under right arm, elbow touching tail piece, strings away from body, neck in front, bow in right hand, player sitting.

Cello player sitting; bass player standing, bow in right hand, instrument in position.

"ONE"—

Violin and viola player hold left arm in front of body, palm in, fingers vertical. (See picture).

Cello and bass player place ball of left thumb against the back of the neck of the instrument.

"TWO"—

Violin and viola player grasp instrument with right hand and lay it in playing position without moving the left hand or changing the position of the left fingers and thumb.

Celio and bass player place fingers on strings with thumb opposite middle fingers.

"THREE"—

Violin and viola player remove left hand and grasp the bow, leaving instrument suspended from shoulder-pad and jaw.

Cello and bass player also grasp bow with left hand, reaching arm in front of strings.

"FOUR"—

Violin, viola and cello players place right thumb. Bass player place two middle fingers.

"FIVE"—

Violin, viola and cello player place middle fingers. Bass player place thumb and first finger.

"SIX"—

All place remaining fingers.

"SEVEN"—

All replace left hand in correct position as at "TWO" and test the position by sliding the hand back and forth on the neck of the instrument, without bending the wrist, at the same time raising the right arm and verifying the position of the thumb on the bow.

When ever a pupil uses an incorrect position the teacher may simply say "SEVEN" and the pupil will test his position as outlined at the command "SEVEN" given in the position drill. This mechanical device is a great time saver in teaching the pupil to play in the proper position from the very first by teaching him to correct it both in the class and when practicing at home. The pupil should often use the mirror and the pictures in his book to correct faulty position during practice periods.

A very common fault of beginners is to allow the right thumb to bend inward instead of outward and the teacher should watch and correct this fault as soon as it occurs, for bending the thumb inward induces a cramped position which must be corrected later.

The above is the only correct way to hold the bow and any inaccuracy and negligence here will result in great difficulties in future correcting of bad habits.

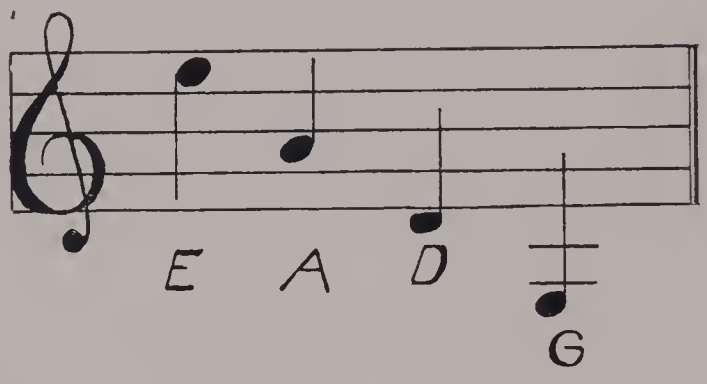
III. How to Produce a Tone.

Place the hair of the bow upon the string while standing before a mirror and observing that every detail of the position is correct. Draw the bow down and up, full length, the bow crossing the string at right angles always. It will be noticed that in order to keep the bow at right angles the right wrist must bend down when playing near the frog and bend back or up when playing near the point of the bow. Continue to draw the bow down and up on the different strings, getting accustomed to the bending of the wrist and keeping the thumb always bent outward. A squeaky tone indicates that the bow is not crossing the string at right angles, so the ear will tell what is wrong when the eye fails to do so. Let the bow lean away from the bridge.

It is not necessary that all the hair always touch the string.

IV. How to Tune the Violin.

The four strings on the violin are called from highest to lowest, the E, A, D and G strings, written:



Tune the A string first by sounding A on a pitch pipe, piano or other instrument and matching the pitch by turning the A string peg with the right hand and picking the string with the left.

Place the instrument firmly in your lap, string end up, holding the neck near the body and picking the string with one hand and turning the peg with the other.

Next, sing A with the syllable *so*; then sing down to *do* and tune the D string with *do*.

Next, call D, *so*; sing down to *do*, and tune the G string with *do*. (If this tone is too low for the pupil he may sing the octave above).

Next, call A, *do*; sing up to *so*, and tune the E string with *so*.

The student will soon learn to recognize the interval of a perfect fifth which lies between each two strings and will eventually learn to tune by sounding two strings at the the same time with the bow, which is the best way of tuning.

While tuning by matching a given pitch from the pitch pipe or other instrument for each string is much easier and quicker at first, and many teachers allow pupils to tune in this manner, it is really the longest way, for it teaches the pupil nothing. Tuning should be done according to the above directions because the pupil is forced to use his ear and to learn to recognize perfect intervals early in his work. A pupil who has been taught singing

in the grades but cannot sing from *so* to *do* in tune has very little chance of becoming a violinist and should be encouraged to study a keyed instrument instead.

This simple way of tuning enables the pupil to tune at home and obviates another criticism of the class method, that of allowing a pupil to practice at home on an untuned instrument. It also teaches him to tune his instrument at the very beginning, one of the most important and most neglected things in the teaching of all the stringed instruments.

V. How to Vary the Pitch.

Let the pupils memorize tunes such as the first ones in the "Universal Teacher" by singing, the *do, re, mi* syllables and then reproducing these tunes by ear. The pupil will discover for himself where to put his fingers on the strings to produce the tones desired.

As has already been stated, the pupil is now required to play simple tunes in several different positions from the very beginning, partly to teach him to hold his violin correctly and partly to allow him to learn to play in all the different positions at once; thus forever freeing him from the prevalent idea that one position is more difficult or advanced than another.

Not only must the pupil know how to play in the different positions, but he must learn to shift from one position to another. He is asked to play simple tunes by ear, shifting from one position to another. The teacher will know that the pupil is playing in various positions or shifts, but the pupil need not know this. Since in violin music the **fingering** is indicated but the **positions** are not, the teaching of specific positions is superfluous as the pupil does not need to know them, but he does need to be able to do them. He is simply asked to start with a certain finger on a certain pitch and play the tune he already knows. It is highly necessary that the pupil should become dexterous in the use of the several positions and shifts and the music of the "Universal Teacher" is arranged with this end in view. Our experience has convinced us that this is the simplest and most effective way to equip the pupil with this skill.

In all our teaching we should be careful about burdening a pupil with superfluous theories when he can pick up all the facts he needs while acquiring skill. In other words he can acquire skill much more quickly by playing certain tunes in various ways if he is not hampered by having to analyze the thing he is doing.

The way teachers often overburden pupils with useless facts and analyses has been embodied in a verse that every teacher might well keep in mind:

"The centipede was happy quite
Until the frog, for fun, said:
'Which leg comes after which?',
Which wrought him up to such a pitch
That he lay distracted in a ditch
Considering how to run!"

THE VIOLA

I. Equipment and Care of the Instrument.

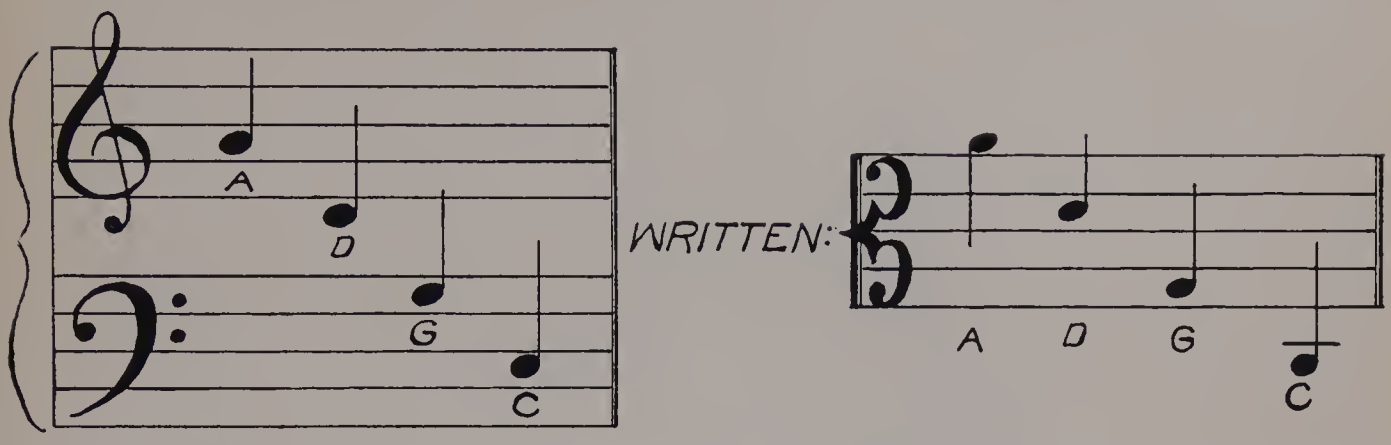
The viola is merely a large size violin and all that has been stated regarding the equipment and care of the violin applies to the viola. See page 31.

II. How to Hold the Instrument.

Every detail of holding the violin and bow applies to the viola, therefore the pupil may follow the directions for holding the violin. See page 33.

III. How to Tune the Instrument.

The strings on the viola are, from the highest to the lowest, A, D, G and C, thus:



Begin by tuning the A, D and G strings as directed for the violin and then taking the octave of the G string as *so,* sing down to *do,* and tune the C string an octave below that. See page —.

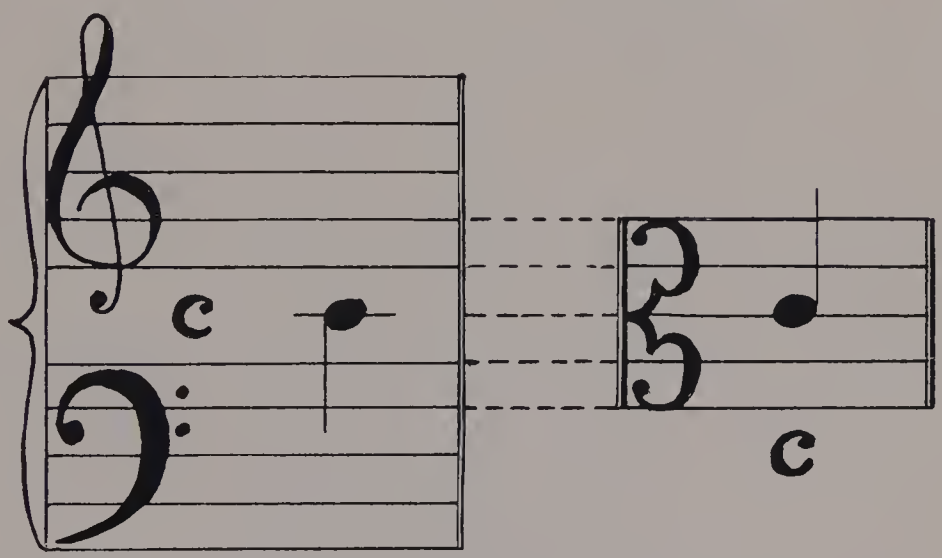
IV. How to Produce a Tone.

See "How to produce a tone" on the violin, page 36.

V. How to Vary the Pitch.

See "How to vary the pitch" on the violin, page 37.

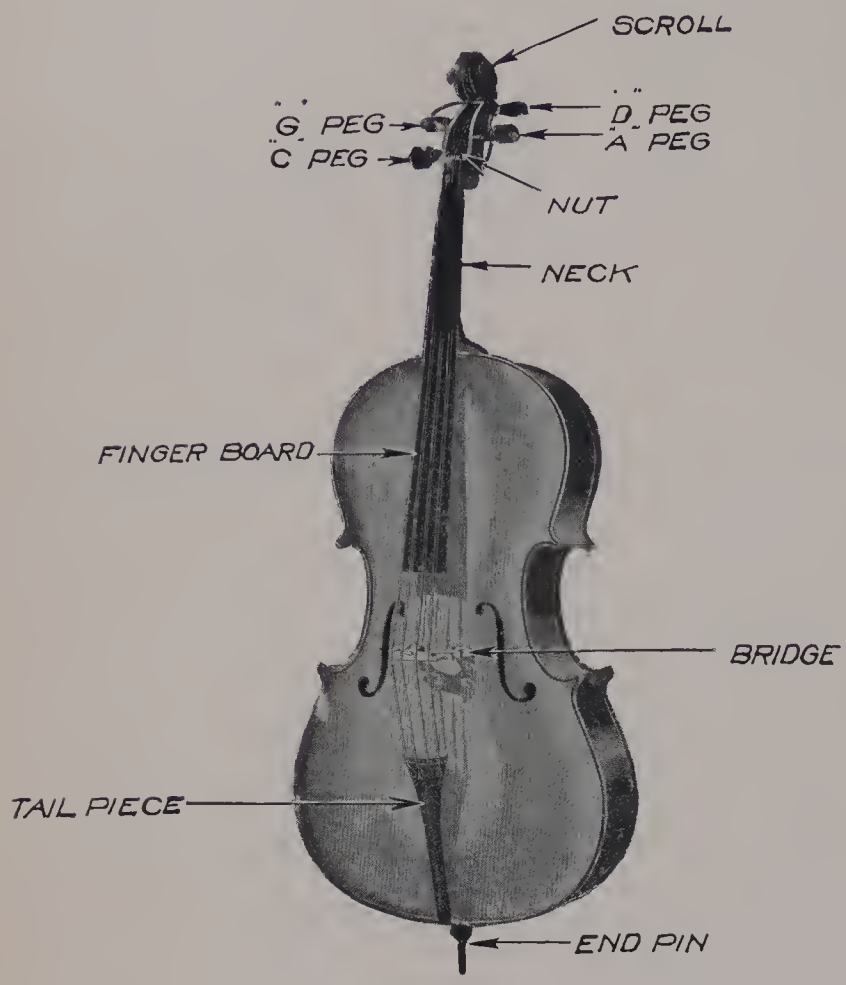
The viola clef need not be a source of great difficulty. Do not teach it by telling the pupil what the note would be if it were on another clef, but what it is just as it stands. For the teacher, however, it may be of interest to note that the C clef is derived from the historic great staff in the following manner:

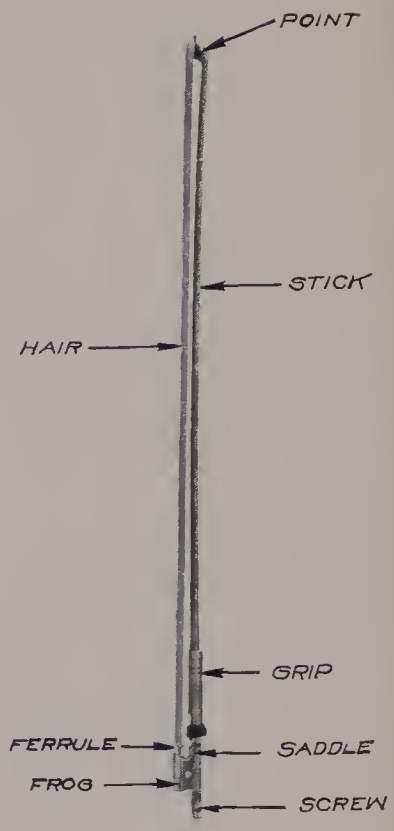


Taking the treble and bass clefs together, the outer three lines of each are discarded. The remaining two lines of each, with the added line in the center for middle C, compose the so-called alto or viola clef. Simply remember that middle C is always on the middle line.

In many cases, in organizing an orchestra, the number of available violinists is greatly in excess of any other instrument. It will save much time if you can persuade some of your players who have already learned to play the violin moderately well to change to the viola. They will have only to restring and retune their violins as violas and learn the new clef. While this is not effective in a tonal sense it is good as a start. It is also very convenient for small children. Later some of these pupils may be induced to purchase violas.

THE VIOLONCELLO OR CELLO





I. Equipment and Care of the Instrument.

All that has been said concerning the care of the violin applies to the cello. The bag should be waterproof to protect the instrument from dampness and sudden changes in temperature. See page 31.

Small children may use three-quarter and half size cellos according to their size and the length of their fingers.

II. How to Hold the Instrument.

The player sits on the edge of an armless chair and the cello is held between the knees, so that the upper right corner of the cello body touches the player's chest and the peg box is close to the left ear of the player. The left foot is extended and the right foot drawn back so that the right knee is lowered to a point below the corner of the instrument. (See picture.)

The ball of the left thumb touches the under part of the neck of the cello and the wrist is bent slightly outward so that the tips of the bent fingers fall perpendicularly on the strings.

The hand does not touch the finger board. The left elbow is held so that the forearm and the hand form a straight line.

The Cello.

How to Hold the Bow.

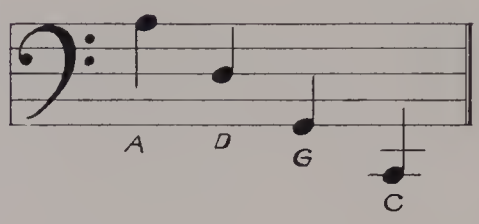
This is the same as "How to hold the bow" for the violin. See page 34.

III. How to Produce a Tone.

Same as "How to produce a tone" on the violin. See page 36.

IV. How to Tune the Cello.

The strings of the cello are called from highest to lowest the A, D, G and C strings, written:



Sound A (second space treble staff) on a pitch pipe or other instrument and tune the A string one octave lower by turning the peg with the left hand and picking or playing the string with the right. If the player's voice has changed he will be able to tune the cello as the violin is tuned as he can sing the same pitch as the cello requires, with the exception of the lowest tone. If his voice has not changed, he will sing as with the viola, but tune the strings an octave lower. See page 39.

V. How to Vary the Pitch.

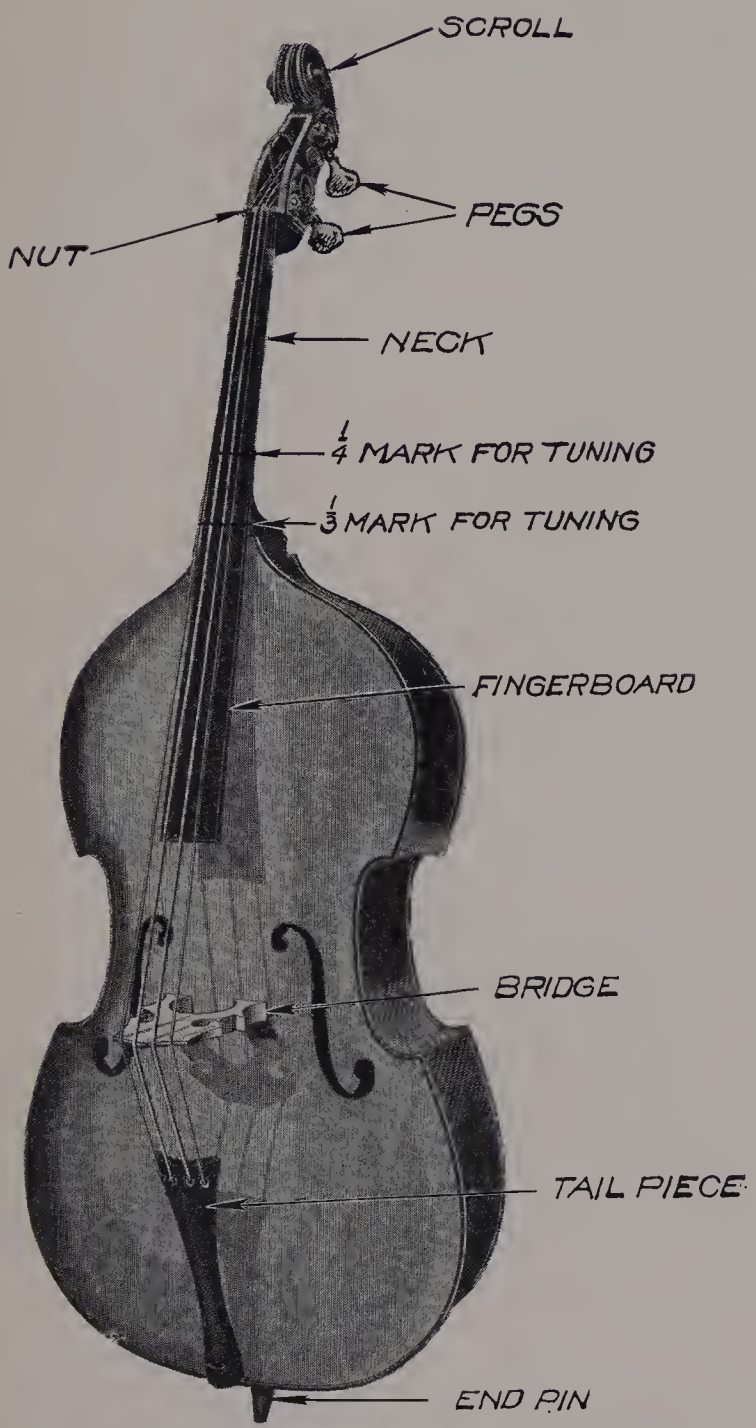
See "How to vary the pitch" for violin, page —.

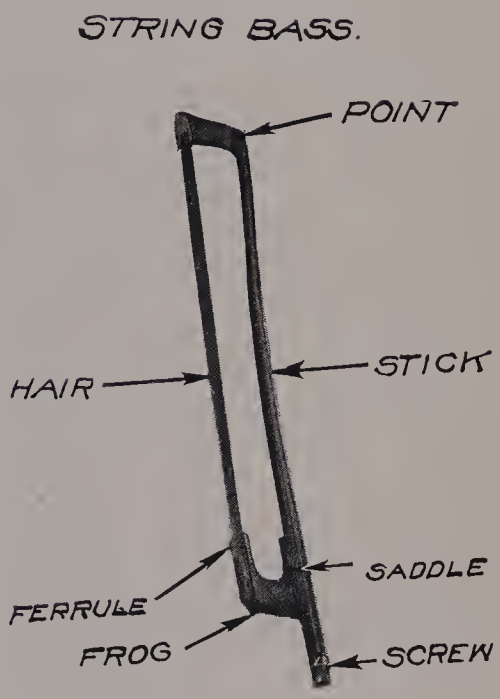
THE DOUBLE BASS (OR "STRING BASS")

I. Equipment and Care of the Instrument.

The bass requires the same care as the violin. See page 31. Changes in temperature are very likely to crack the bass and the player should see that all cracks are mended as soon as they occur, or the wood will become warped and the repairing difficult. The bow requires much more resin than any other stringed instrument and special bass resin should be used. When not in use the instrument should be placed in its waterproof bag and laid on its side on the floor to eliminate all danger of its falling and cracking. Never leave any stringed instrument near a stove or radiator, for it will dry out and the wood will split.

Half and one-quarter size basses may be had for small children. Usually children in sixth grade and under should use one-quarter size instruments; those in seventh and eighth grades half size, and those in high school three-quarter size instruments. Full size basses are very rare, the three-quarter size being the standard size in use by professional players.





The Double Bass.

II. How to Hold the Instrument.

Views of Double Bass

The player stands behind the bass and a little to the right so that the corner of the instrument touches his chest. The weight of the player rests on the right foot and the left knee is bent outward against the back of the instrument. The left hand is placed over the fingerboard with the thumb resting on the back of the neck of the instrument. The wrist is bent outward so that the hand does not touch the neck and the fingers are above the fingerboard. Because of the length of the strings and the amount of pressure required to press the strings down against the finger board, only the first, second and fourth fingers are used, the fourth finger being supported by the two middle fingers which help hold the string down; the second finger, when used, being supported by the first. (See picture.)

The bow is held in the palm of the right hand with the two middle fingers closing over the frog under the stick, the thumb and index finger meeting on top of the stick, and the little finger extending straight out along the frog toward where the hair is fastened. The

Two Methods of Holding the Bow.

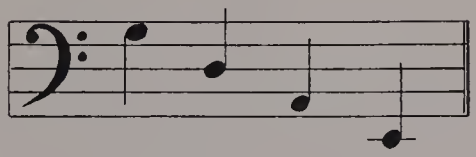
thumb and index finger are used to guide the bow and to press the bow against the strings. The two middle fingers draw the bow while the little finger helps to guide the bow across the strings (see picture). Other positions are used but this seems to be the best.

III. How to Produce a Tone.

Place the bow on the string and draw it slowly and steadily back and forth, using the entire length of the bow. Stand before a mirror and watch your position and see that the bow crosses the string at right angles. More pressure is required to cause the E string to vibrate than the others. Each tone should be started with considerable pressure, which may be relaxed as soon as the tone begins to sound.

IV. How to Tune the Bass.

The strings are called from highest to lowest the G, D, A and E strings, written:



but sounding an octave lower.

For ease of tuning, the pupil should measure the distance from the bridge to the nut which the strings pass over near the pegs, and make a permanent mark across the fingerboard exactly one-fourth of the distance from the nut to the bridge and another mark exactly one-third of the distance from the nut to the bridge. These marks will be about four inches apart on the fingerboard.

Place the little finger of the left hand **lightly** on the one-third mark of the G string so as to produce a harmonic; draw the bow across the G string until the tone matches D, on the space below the treble staff. Without removing the little finger from the one-third mark on the G string, place the index finger on the one-fourth mark of the D string, sound the two strings together and tune the D string until the two tones are exactly alike in pitch. Now slide the hand over to the D and A strings and repeat this tuning, next repeat with the A and E strings. The great depth of the double bass tone necessitates tuning by harmonics and the above process is very simple and sure when learned.

V. How to Vary the Pitch.

Proceed as with the violin (see page 37), except that the tones played will sound two or more octaves lower than the voice. Do not allow the palm of the left hand to touch the fingerboard, as that will greatly lessen the reach of the fingers. The fingers fall flat upon the strings, not tips down on the strings as with other stringed instruments.

THE HARP

The harp may be compared with the piano and other instruments which are capable of producing complete music. Owing to its cost and rarity, it is not worth while to consider it from the standpoint of class instruction.

The modern harp has three stops for each string, the stops being regulated by foot pedals. The harp is a lovely instrument both for solo and accompaniment work and is a valuable asset to any orchestra. A special effort should be made to induce pupils who can afford the money to purchase a harp, to learn to play it under private instruction.

THE WOOD-WIND INSTRUMENTS
THE FLUTE

The physical requirements of the flute student are even upper teeth. A receding lower jaw is no handicap. Persons with lips that are dry and have a tendency to crack, should not play the flute. A good whistler is the best material for a flute student.

I. Equipment and Care of the Instrument.

The flute is a wooden or metal tube with holes along the side, the opening or stopping of which regulates the pitch.

If made of wood it is very likely to check or split unless excellent care is taken of it until the wood becomes well seasoned. This care consists of wiping the instrument dry inside and out after using, and oiling the inside at least once a month at a time when the instrument is perfectly dry. The keys should be oiled about once a month by dropping a tiny drop of oil, as from the end of a toothpick, at both ends of each axle and at the base of each spring. Grease all cork joints with mutton tallow occasionally to make them work easily. If the pads become sticky, run a handkerchief under them and then dust under the pads with talcum powder.

II. How to Hold the Flute.

Hold the instrument level, the mouth hole in front of the lower lip and the body of the instrument extending to the right, with the fingers of the left hand covering the three holes nearest the mouth piece, and three fingers of the right hand covering those near the end (see picture).

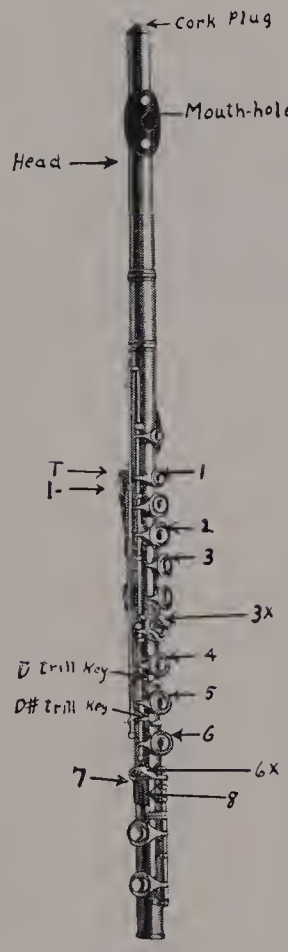
III. How to Produce a Tone.

Purse the lips and blow across the mouth hole as if vigorously whispering the syllable "too." If no tone results, slightly vary the pressure of the breath and the position of the lips, mouth and mouth piece until a clear, even tone results.

IV. How to Tune the Flute.

Sound A (with two fingers and the thumb down) and match with A from a pitch pipe or other instrument by sliding the mouth-piece in or out. Sliding the mouth piece out lowers the pitch of the entire instrument, while sliding it in raises the pitch. The adjustable cork in the end of the mouth piece affects the pitch of the instrument somewhat and also the intonation of the different tones, and the pupil should not attempt to regulate it. If the flute "blows" hard, have a professional flutist adjust the cork.

V. How to Vary the Pitch.



The Flute.

Cover the holes one at a time, beginning with the one nearest the mouth-piece. With each change, repeat the vigorously whispered syllable "too". Blow slightly harder for the higher tones and more gently for the lower ones.

The "Universal Teacher" contains simplified fingering charts for both Boehm and old system flutes although the old system flute has been discarded by all professional players.

Memorize the first tunes in the book by singing the *do, re, mi* syllables, then play the tunes by ear, starting with six fingers down. Next play the tune as written in the book and observe the fingering marks. Then proceed according to directions in the student's book.

THE PICCOLO

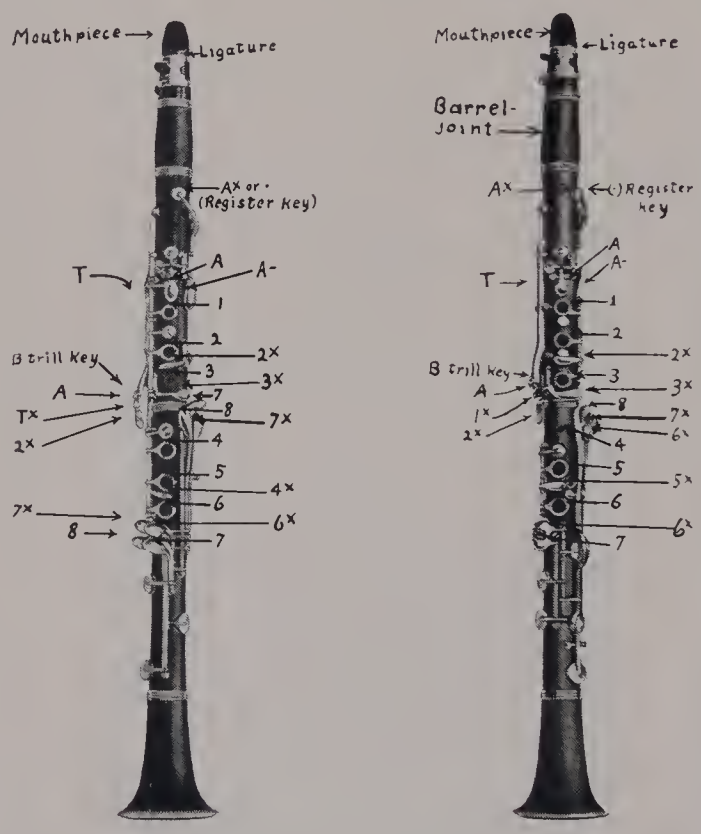
The piccolo is a small flute pitched an octave higher than the flute, but played the same. The piccolo lacks the lowest tones of the flute (C and C-sharp). The music is written as for the flute, but sounds an octave higher.

The Db flute and piccolo are used in bands and are the same as ordinary instruments except that they sound a half step higher when played, consequently the music must be written one-half step lower than the music played by the ordinary or C instruments. The Db flute may be tuned down to C in an emergency by sliding the mouthpiece out an inch or more, but the result is not very satisfactory because of the added difficulty of blowing in tune.

THE CLARINET

The physical requirements of the clarinet student are lower front teeth that are even and not very sharp, and fingers that are long enough to cover the holes in the instrument without effort. Pupils whose lower jaws protrude are not suited to the clarinet but a receding lower jaw is no handicap. Good singers make good clarinet players for they have a good idea of tone quality which they can imitate successfully on the clarinet.

I. Equipment and Care of the Instrument.



Two Views of Clarinet.

The care of the clarinet is the same as that of the wooden flute (see page 46).

The mouthpiece should be kept clean by running a cloth the size of a handkerchief or smaller, through it after using. Attach a small weight to a string tied to the cloth. Drop the weight through each section and pull the cloth carefully through. The reed should be kept very clean and should never be clamped very tightly to the mouthpiece for that will cause the mouthpiece to warp when the wood swells with dampness. The pupil should always loosen the ligature, or clamp, which holds the reed in place, after playing.

How to Trim the Clarinet Reed.

If the reed blows too hard, scrape it thinner at the beginning of the cut farthest from the point. If it blows too easily, clip the end very slightly. Use a sharp knife. Never use scissors as they will split the reed.

The Boehm system clarinet is much to be preferred to the Albert or old system, which is much more difficult to play. The Boehm clarinet is more delicate, however, and needs careful handling, especially when putting the joints together or taking them apart, when there is danger of bending the overlapping keys.

II. How to Hold the Instrument.

The Clarinet.

Sit erect with chest expanded and hold the clarinet at an oblique angle so that the bell is near the knees.

Place the left thumb over the hole in the under side of the instrument and bend the wrist outward so that the fingers are held directly over the holes in the upper side of the clarinet. The weight of the instrument is carried on the right thumb, which is placed under the thumb rest or hook so that the outer joint of the thumb touches the under side of the rest (see picture).

Hold the fingers of the right hand over the holes, the same as those of the left hand. The tips of the fingers should extend nearly one-half inch beyond the holes.

III. How to Produce a Tone.

Place the mouthpiece in the mouth with the reed touching the lower lip and the upper teeth touching the top of the mouthpiece about one-half inch from the tip. Draw the lower lip in over the lower teeth and curl the upper lip against the upper teeth, but not under them, as in smiling.

Blow gently without biting on the mouthpiece, keeping all the fingers off the holes and keys. Whisper the syllable "too" by touching the tip of the tongue to the tip of the reed and then drawing the tongue away very suddenly. Start every tone with "too" and keep trying until the result is a smooth soft tone. Do not puff out the cheeks as this will tire and weaken the muscles.

IV. How to Tune the Clarinet.

The clarinet is tuned in about the same manner as the flute (see page 47). Since all orchestras tune to the A of the oboe, pitch-pipe or piano, the B-flat clarinet would sound B and tune with the pitch-pipe A. The fingering for B is shown on the fingering chart in the "Universal Teacher."

V. How to Vary the Pitch.

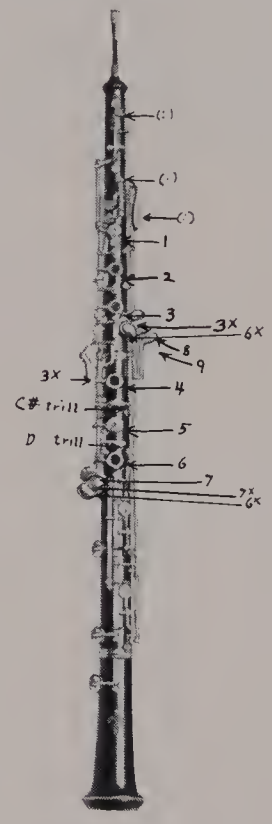
The holes in the body of the instrument are the means of lengthening or shortening the air column inside the instrument, the length of the air column determining the pitch. By adding a finger at a time, beginning with the left thumb which closes the hole nearest the mouthpiece, the pitch is lowered by scale degrees, the half steps being produced by pressing the keys which open intermediate holes. The fingering chart in the "Universal Teacher" shows in a simple manner the fingering for the entire compass of the clarinet, and the simple tunes give the pupil a chance to learn to play the instrument in an easy, logical and musical way.

THE OBOE

The physical requirements of the oboe student are plenty of grit and a leaning toward mechanics, in addition to the ability to sing well. As with the clarinet, the ideal of tone quality must be high or the effort will be useless.

The new, or conservatory system oboe, is much easier to learn than the old, imperfect system; and students are urged to procure the newer style.

I. Equipment and Care of the Oboe.



The oboe requires the same care as the wooden flute (see page 46). The key mechanism is more delicate than that of any other instrument and the student must exercise great care to avoid bending keys or getting the tiny set screws out of adjustment. The pupil should learn to trim and adjust his own reeds as soon as possible for this is one of the most important things for an oboe player to know. Great care is necessary to protect the reeds from breaking and they should be wrapped in cotton and kept in a reed case when not in use. The instrument should never be laid down without first removing the reed and placing it in its case.

How to Trim Oboe Reeds. If the reed blows too hard, scrape it thinner at the beginning of the cut farthest from the point. This also lowers the pitch of the instrument. If it blows too easy, clip the end very slightly. This raises the pitch of the instrument. Use

a very sharp knife. Never use scissors, they will split the points. If the reeds leak at the sides, wind transparent gummed mending tape once around them to within half an inch of the points. To keep the opening between the points of the reeds of the proper size, wind a piece of the finest copper wire (that from a flexible electric light cord or brass picture wire will do) twice around the reeds at the middle of the taper. This wire can be slipped up or down as necessary. To make this clear, study the picture of the reeds very carefully.

The quickest way to develop an oboe player is to transfer a good clarinet player to the oboe. The clarinet player has already learned a similar instrument, and has learned to care for and adjust reeds. The transition is easily made.

Oboe Reed.

II. How to Hold the Instrument.

The oboe is held in the same manner as the clarinet except that the left thumb has no hole to close.

The Oboe.

III. How to Produce a Tone.

The reed is inserted in the mouth about one-half inch with the lips drawn over the teeth so the reed does not touch the teeth. With some slight pressure of the lips upon the reed and with one, two or three fingers of the left hand upon the upper holes, force the breath into the instrument in the same manner as described for the clarinet (see page 49).

IV. How to Tune the Instrument.

Although the oboe usually gives the pitch for the orchestra, it is possible to vary its pitch to some degree by pulling the reed part way out from its pocket, which lowers the pitch of the instrument. Another and more effective way is to trim the reed slightly at the point to raise the tone, and lengthen the "lay" to lower the tone. The latter method is possible only to experienced players who understand thoroughly the delicate operation of trimming reeds.

V. How to Vary the Pitch.

Attempt descending scale passages by placing the fingers over the holes, one at a time, beginning with the holes nearest the mouth. Half steps are produced by using the keys lying between the respective holes. See fingering charts and music in the "Universal Teacher."

THE ENGLISH HORN

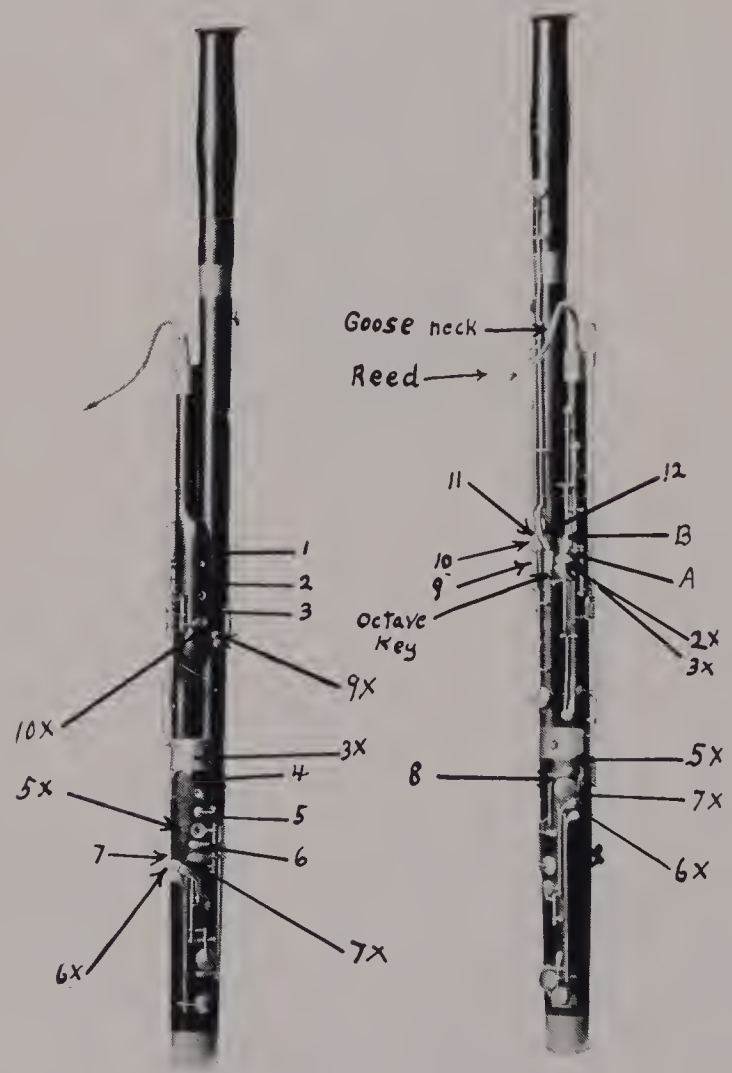
The English Horn, as stated before, is only an enlarged oboe and is similar to it in every particular, except that all the tones sound a fifth lower than written. There is so little call for the English horn in orchestra work that it is usually played by one of the oboe players when occasion calls for it, just as one of the flute players plays the piccolo when needed.

THE BASSOON

While the bassoon is really a bass oboe, the mechanism is not so easily disarranged and the reed is less likely to give trouble. The fingering is, however, much more difficult than that of any other wind instrument. The fingering is somewhat similar to that of the clarinet and a good clarinet player will become proficient on the bassoon with a few weeks' practice.

The bassoon student must be mechanically inclined so that he can learn to adjust and trim reeds. He must be a quick thinker, have a keen musical ear and long fingers.

I. Equipment and Care of the Instrument.



Two Views of Bassoon.

The bassoon requires the same care as the clarinet and the reeds must be kept in a special reed case or wrapped in cotton and kept in a box. The teacher should assist the student in finding a place where good oboe and bassoon reeds can be purchased, as poor reeds are the greatest handicap to beginners.

How to Trim Reeds for the Bassoon. If the reeds blow too hard, scrape them thinner at the beginning of the cut farthest from the point. This also lowers the pitch of the instrument. If it blows too easily, clip the end very slightly. This raises the pitch of the instrument. Use a very sharp knife. Never use scissors, as they will split the ends.

If the reeds leak at the sides, wind transparent gummed mending tape once around the reeds to within an inch of the end. To keep the opening between the reeds of the proper size, slide the wire up or down as needed.

Special care must be taken of the goose-neck or "S" pipe, which is easily bent or broken. When the instrument is laid aside, place the reed in its case and the goose-neck in the open end of the instrument.

Bassoon Reed.

II. How to Hold the Instrument.

The bassoon is hung by the neck strap with the lower part of the instrument on the right side of the player and just high enough so that the reed strikes the lips when the player is sitting erect. A leather strap is best because it can be set at the right length and it will stay while the adjustable cord needs to be adjusted many times at each practice.

The Bassoon.

The instrument is balanced between the right thumb and the base of the index finger of the left hand. The right thumb must be held so that it is free to operate the keys near it and the left thumb must be entirely free. The fingers control the holes on the front of the bassoon and the thumbs control the keys which cover the holes on the back side or lower joint (see picture).

III. How to Produce a Tone.

(See oboe, page 51).

IV. How to Tune the Instrument.

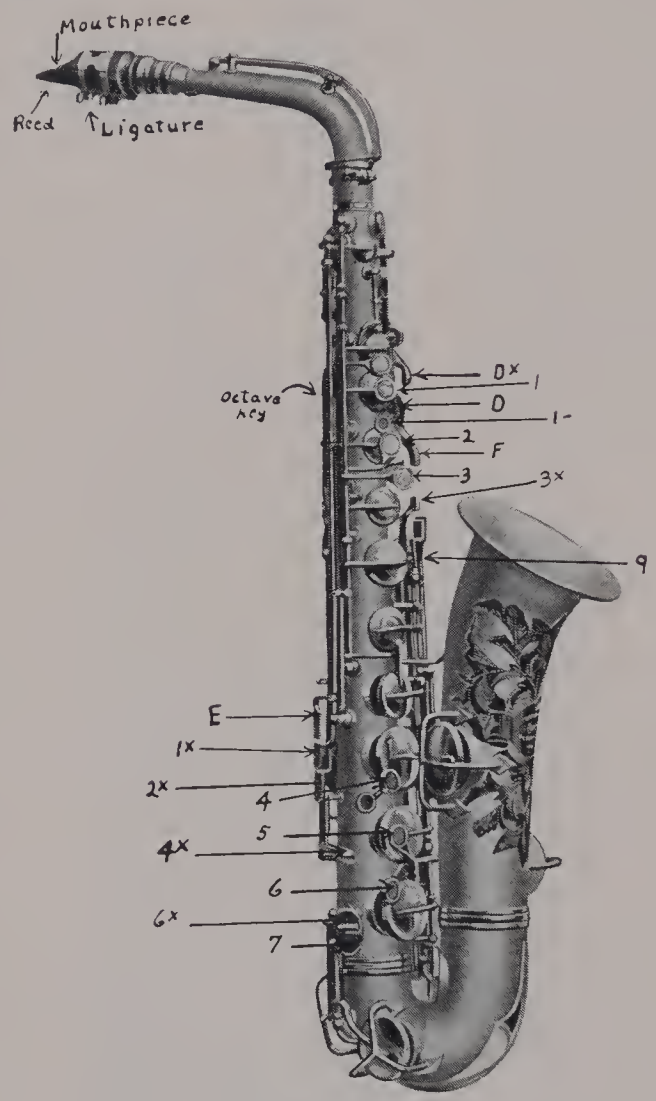
It is possible slightly to lower the pitch of the bassoon by partially drawing the goose-neck from its socket. The pitch may further be changed by trimming the reeds (see oboe, page 51). Tune A (five fingers down) with the A of the oboe which is an octave higher.

V. How to Vary the Pitch.

See oboe, page 51; also fingering chart and music in the "Universal Teacher."

THE SAXOPHONE

The physical requirements of the saxophone player are lower front teeth that are even and not very sharp and good lung capacity. The saxophone requires greater volume of breath than most instruments.



The Saxophone

I. Equipment and Care of the Instrument.

The saxophone is easily kept in good condition if the mouthpiece and goose-neck are cleaned frequently by running a piece of cloth the size of a handkerchief or smaller, through them. The reed should never be clamped very tightly to the mouthpiece, as this will cause the latter to warp and cave in under the reed, a very frequent condition. The reeds should be kept in a reed case.

How to Trim Saxophone Reeds. If the reed blows too hard, scrape it thinner at the beginning of the cut farthest from the point. If it blows too easily, clip the end very slightly. Use a very sharp knife. Never use scissors, as they will split the reed. If the pads become sticky, clean them by running a cloth under them and then dusting talcum powder under them. The pads near the mouthpiece need replacing occasionally when they become hardened. This condition is apparent when an unusual amount of breath pressure is required to produce a tone.

II. How to Hold the Instrument.

The saxophone is held at the right side of the player with the weight supported by a strap around the player's neck. The right thumb is placed under the thumb piece and helps to balance the instrument. The fingers of the left hand control the fingerplates on the upper half of the instrument while those of the right hand control those of the lower half. The strap should be just long enough to allow the mouthpiece to reach the mouth of the player when he is sitting or standing erect.

The Saxophone.

III. How to Produce a Tone.

Place the mouthpiece in the mouth, reed side down, so that the lips extend about three-quarters of an inch over the mouthpiece. Draw the lower lip over the teeth and curl the upper lip as in smiling. Blow gently without biting the mouthpiece, keeping the fingers off the finger-plates and keys. Whisper the syllable "too" and sustain each tone until it is smooth and soft.

IV. How to Tune the Instrument.

The pitch of the instrument may be changed by drawing the mouthpiece in or out over the end of the goose-neck. The further it is drawn out the lower the pitch of the instrument becomes.

The alto and baritone saxophones tune F-sharp (three fingers of the left hand and the middle finger of the right hand down) to A on the pitch-pipe, the saxophone tone sounding one and two octaves lower, respectively. The soprano and tenor saxophones tune B (first finger of left hand down—with A on the pitch pipe, the tone of the tenor saxophone sounding an octave lower than the pitch-pipe.

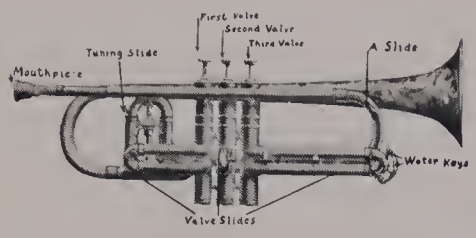
The C or "melody" saxophone tunes A (two fingers of left hand down) with A on the pitch-pipe, the saxophone tone sounding an octave lower than the pitch-pipe.

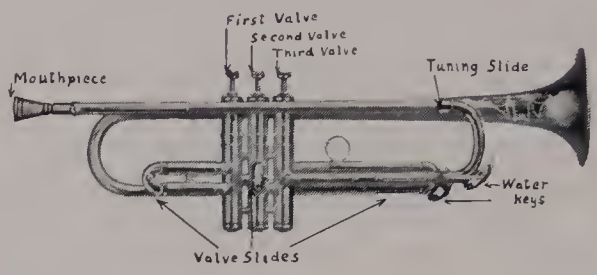
V. How to Control the Pitch.

Attempt descending scale passages by pressing down the finger-plates one at a time, beginning with the one nearest the mouthpiece. Do not allow the cheeks to puff out. Play softly and smoothly. Consult the finger chart in the "Universal Teacher," which shows in a simple manner the fingering for the entire compass of the saxophone.

THE CORNET AND TRUMPET

The physical requirements of the student are thin lips and even, regular front teeth, so that the closed teeth present an even surface.





I. Equipment and Care of the Instrument.

The instrument should be kept in its case when not in use. The tuning slide, A crook and valve slides should be greased with vaseline or mutton tallow at least once a month or they will stick. The valves, or pistons, should be moistened with saliva before playing and whenever they begin to stick. Never use oil on the valves unless you use a special preparation called valve oil which must be continually used if once begun. Oil becomes gummy and causes the valves to move slowly. The valves should be cleaned with ammonia occasionally to remove all sediment and corrosion.

II. How to Hold the Instrument.

Grasp the instrument by the middle with the left hand inclosing the three valve chambers (see picture). Hold the instrument so that the upper edge of the bell is on a level with the eyes of the player. Place the right thumb between the first and second valve chambers without bending the joint and let the first three fingers fall naturally over the three finger-plates. The valve under the first finger is called the first valve, that under the second finger the second valve and that under the third finger the third valve.

III. How to Produce a Tone.

Draw the lips back firmly across the teeth as when smiling. Press the mouthpiece against the stretched lips so that the dividing line between the lips crosses the center of the

mouthpiece. Vigorously whisper the syllable "too" into the instrument, followed immediately by a steady flow of breath through the stretched lips. If no tone results, vary the tension of the lips and force of breath until a smooth tone is produced and sustained for several seconds. When the lips become tired the pupil should rest a moment and then try again.

IV. How to Tune the Instrument.

The cornet is made in so many different models that the pupil will have first to determine which is the tuning crook and which is the A crook. The A crook usually has an adjustable stop which prevents it from pulling entirely out (some old makes have a separate shank or tube, which is kept in the case when not in use). The tuning crook is located somewhere between the mouthpiece and the valves along the tube which runs from the mouthpiece to the valves. It may be on the curve near the bell or the curve near the mouthpiece. When this tuning crook is extended, it lengthens, and thereby lowers the pitch of the entire instrument.

The **Bb** cornet (A crook pushed in) tunes B, second valve down, to A on the pitch-pipe or piano. The **A** cornet (A crook pulled out) tunes C, no valves down, to A on the pitch-pipe.

V. How to Vary the Pitch.

Without using any of the valves the player can play *do, so, do, mi, so, do,* through two octaves, by varying the lip tension and breath pressure. A beginner will do well if he is able to play the first three of the above tones.

The valves are used to bridge the gaps between these "open" tones, as follows:

The second valve lowers each "open" tone one-half step.

The first valve lowers each "open" tone one whole step.

The first and second valves together, or the third valve, lowers each "open" tone one and a half steps.

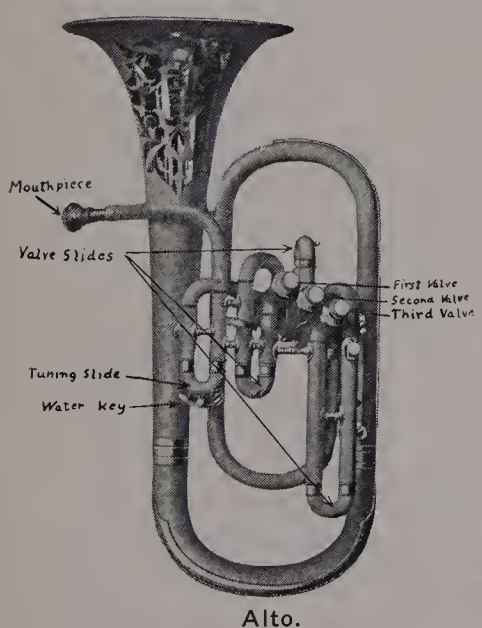
The second and third valves together lower each "open" tone two whole steps.

The first and third valves lower each "open" tone two and a half steps.

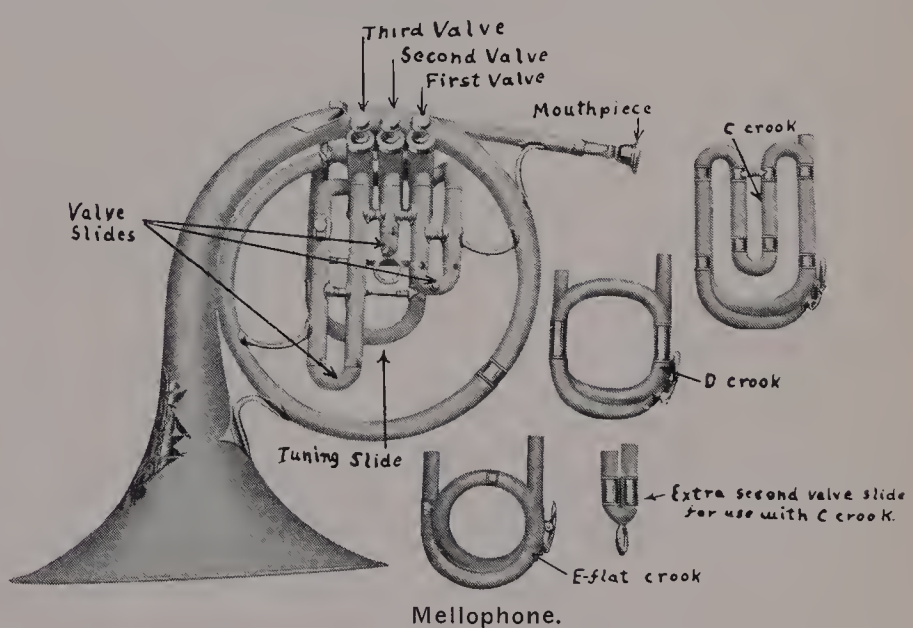
The first, second and third valves together lower each "open" tone three whole steps.

A complete fingering chart for the cornet is found in the "Universal Teacher."

THE ALTO AND MELLOPHONE OR BALLAD HORN



Alto.



Mellophone.

The physical requirements for the student are rather even, regular front teeth and lips of moderate thickness.

I. Equipment and Care of the Instrument.

(See Cornet, page 56).

II. How to Hold the Instrument.

Alto Horn: The left hand grasps the instrument in a convenient manner, according to the shape of the instrument. Altos are made in a number of different shapes, upright, circular, cornet model, etc. The right hand is held as the cornet. See picture and read under cornet, page 56.

Alto.

Mellophone.

Mellophone or Ballad Horn: The left hand either grasps the edge of the bell or is inserted in the bell; the right hand is held the same as the cornet. See picture.

III. How to Produce a Tone.

(See Cornet, page 56).

IV. How to Tune the Instrument.

Alto in Eb: Tune F sharp (second valve down sounding fi) to A on the pitch-pipe. Manipulation of crooks same as for cornet (see page 57).

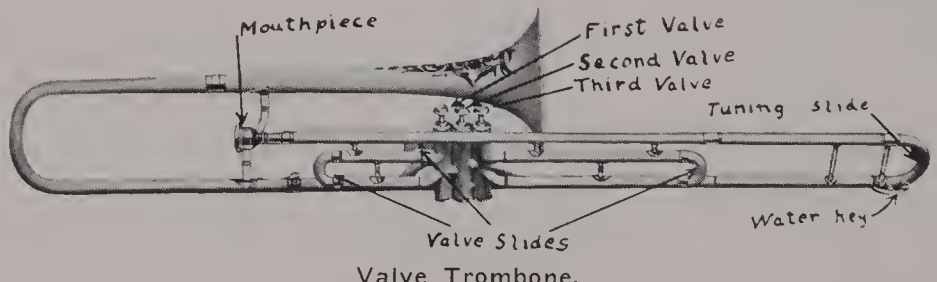
Mellophone or ballad horn in F: Tune E (first and second valves down, sounding mi) to A on the pitch-pipe, the tone of the instrument sounding an octave lower than that of the pitch-pipe (see cornet, page 57).

V. How to Control the Pitch.

(See cornet, page 57).

VALVE TROMBONE, TENOR HORN AND BARITONE

If the teacher wishes to have the pupil learn the baritone or the tenor horn in the treble clef, he may use the cornet book. This is undesirable, however, and no book of the "Universal Teacher" is printed for this. The book for these instruments is printed in the bass clef.

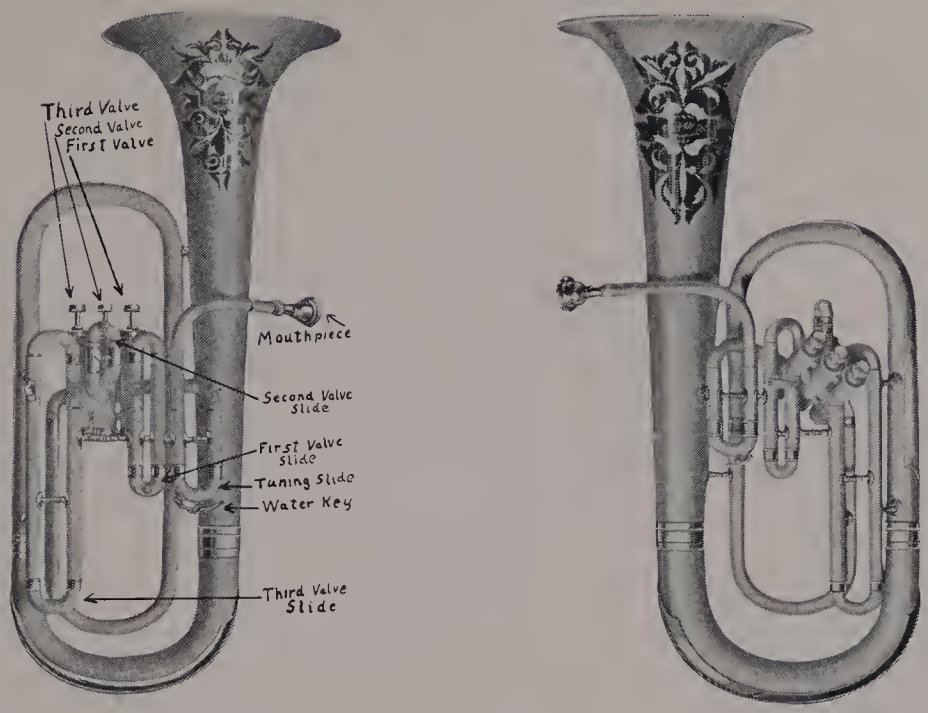


Valve Trombone.

The physical requirements for the student are lips of medium thickness and fairly even front teeth.

I. Equipment and Care of the Instrument.

(See cornet, page 56).



Tenor Horn.

II. How to Hold the Instrument.

The valve trombone is held like the cornet while the tenor and baritone horns are held like the alto. See picture.

Baritone.

III. How to Produce a Tone.

(See cornet, page 56).

IV. How to Tune the Instrument.

The tuning of these instruments is the same as that of the cornet in Bb except that the tone of these instruments will sound an octave lower than that of the pitch-pipe. See page 57.

V. How to Vary the Pitch.

(See Cornet page 57).

THE TUBA

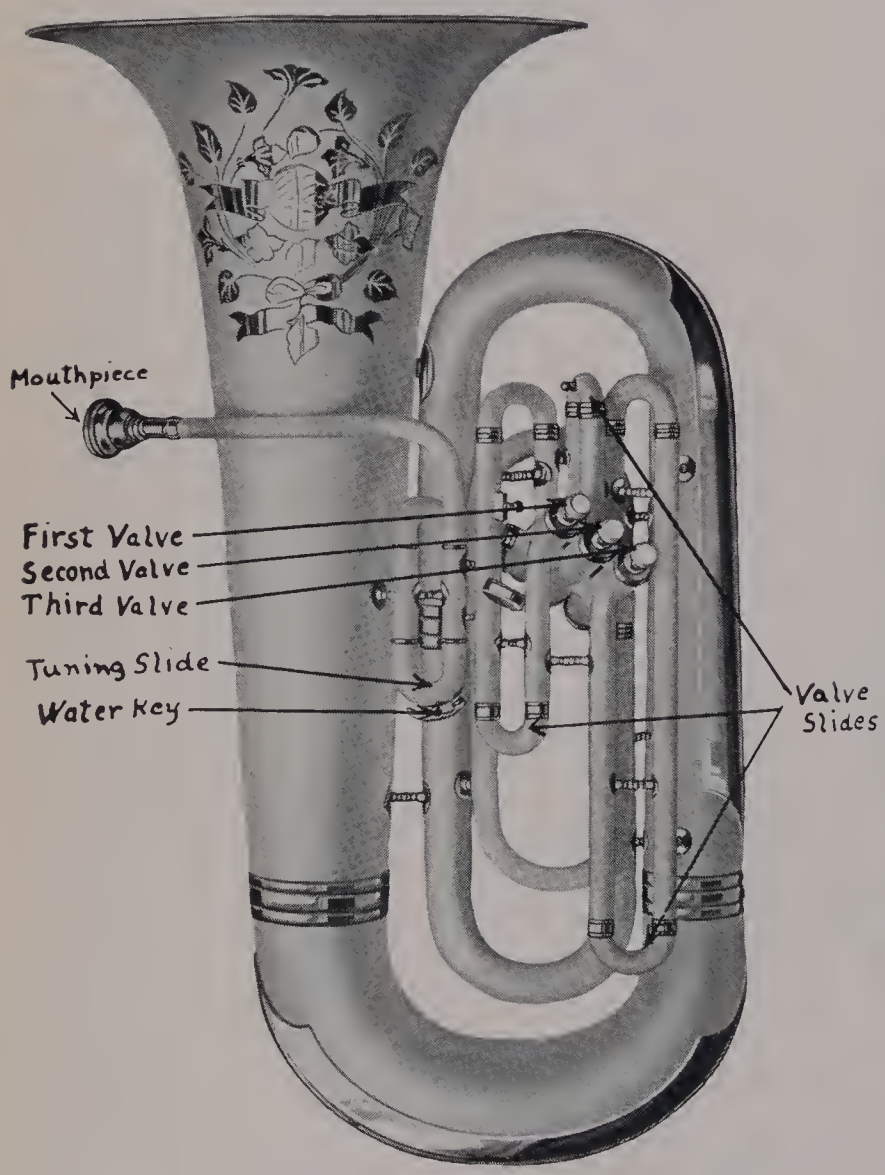
The physical requirements of the tuba student are fairly thick lips and good lung capacity.

The ordinary tuba is built in Eb, but others are made in Bb. Occasionally one is found in C. The helicon bass, the Sousaphone and the monster double Bb bass are all tubas of different shapes and sizes.

I. Equipment and Care of the Instrument.

The ordinary upright tuba is best for school use because it is kept in a case while the other models would require a case too large to be carried. The ordinary tuba may be carried while marching as easily as the other models.

The care of the instrument is the same as that of the cornet.



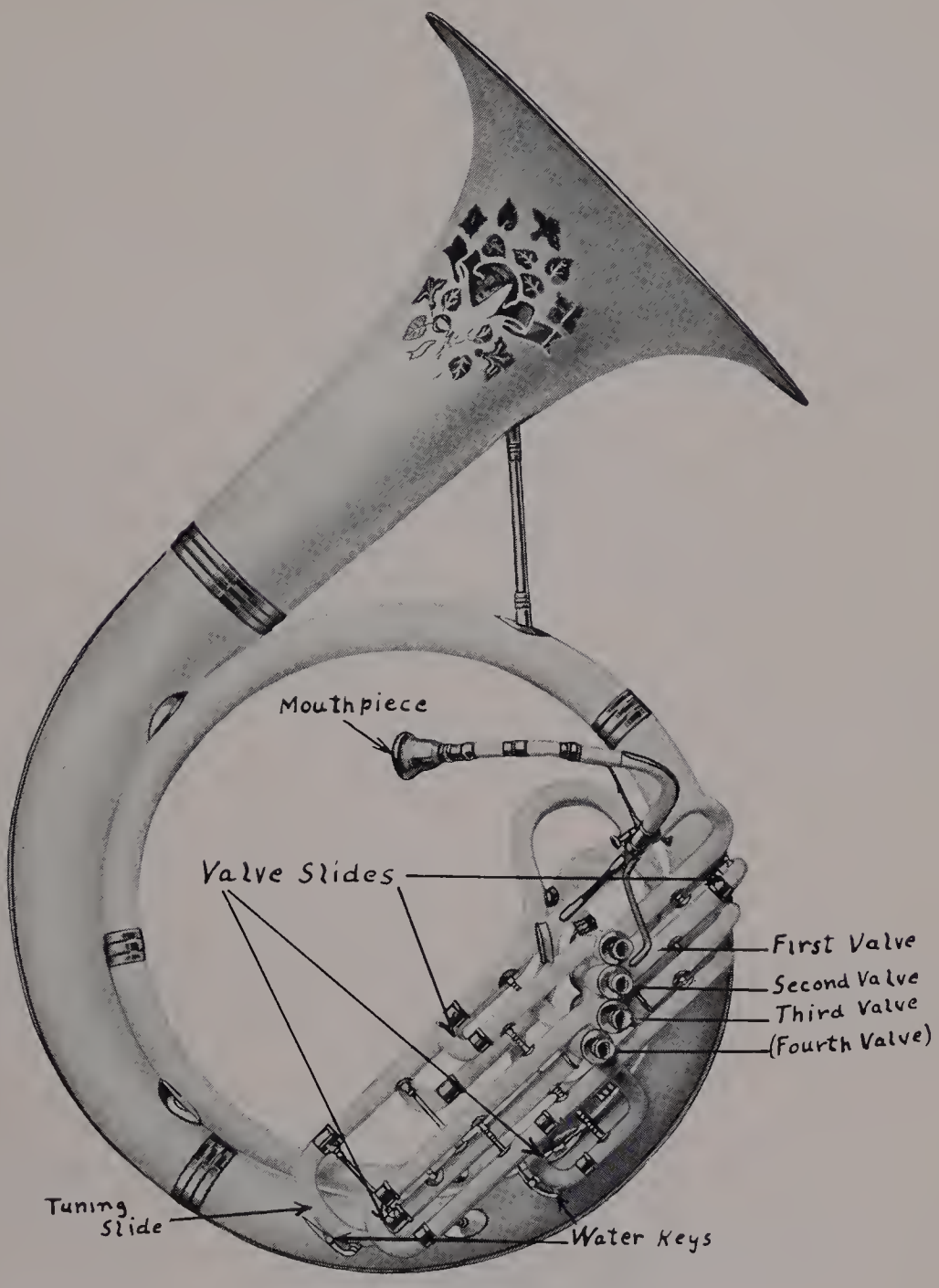
Tuba.

II. How to Hold the Instrument.

The upright tuba is held like the alto or baritone. The other models are held in a position that allows the player to sit or stand erect. See pictures.

III. How to Produce a Tone.

(See Cornet, page 56).



Tuba.

IV. How to Tune the Instrument.

The Eb tuba is tuned in the same manner as the alto except that the tone of the instrument is two octaves lower than the tone of the pitch-pipe. See page 58.

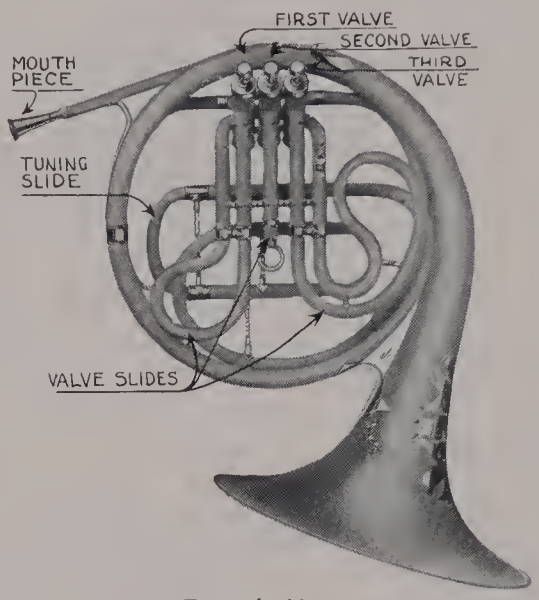
The double Bb tuba is tuned in the same manner as the baritone except that the tone of the instrument is two octaves lower than that of the pitchpipe. See page 59.

V. How to Vary the Pitch.

(See Cornet, page 57).

THE FRENCH HORN

The physical requirements of the French horn student are a very keen musical ear and even front teeth. Although the mouthpiece is as small as that of the cornet, students with thick lips often become the best of players, because the greater depth of the mouthpiece allows the player to utilize the inner surface of the lips as the point of contact. This is called the "inside embouchure" and many artists insist that it is preferable to the usual method of tone production.



French Horn.

I. Equipment and Care of the Instrument.

(See Cornet, page 56).

II. How to Hold the Instrument.

Place the right hand inside the bell of the horn with the palm of the hand cupped as though holding an apple. The valves are operated with the fingers of the left hand. See picture.

French Horn.

The tone quality is regulated by the righthand which is pushed into the bell far enough to make the tone sound somewhat muffled. For certain effects the hand is pushed into the bell almost far enough to stop the aperture, while for other effects it is partially withdrawn.

III. How to Produce a Tone.

(See Cornet, page 56).

IV. How to Tune the Instrument.

(See Cornet, page 57).

Tune E (no valves, *mi*) to A on the pitch-pipe, the tone of the horn sounding one octave lower than that of the pitch-pipe.

V. How to Vary the Pitch.

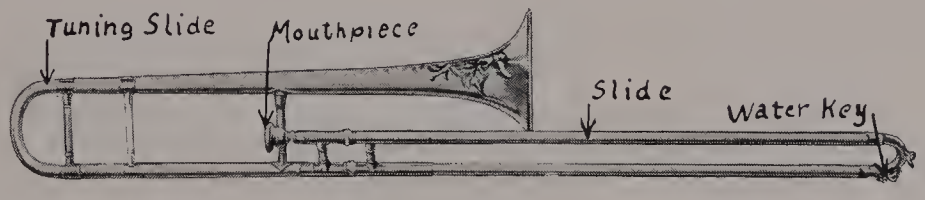
The French horn differs from the cornet and other brass instruments in that it has more open tones. This is due to the great length of the tubing (almost equal to the tuba), and the small bore, which give the horn a greater range than any other brass instrument. The easiest tones to produce are *do, mi, so, do* and a false tone slightly higher than *la*, the low *do* being the pitch F below middle C on the piano. *So* and *do* an octave lower than the *so* and *do* in the above range are possible; while *re, mi, fa, fi, so, la, li, ti* and *do* above the high *do* are procurable without the use of valves. With so many open tones it is very easy for the player to play the wrong tone unless he has a good ear and is very careful.

The valves vary the pitch in the same degree as those of the cornet (see page 57). The open tones are so close, however, that the third valve is seldom needed except in the lower octave.

From the fingering chart in the "Universal Teacher" it will be seen that many tones may be fingered in several different ways. The intonation of the French horn differs in different instruments and a fingering that sounds in tune on one instrument will not sound in tune on another so the student must study his particular instrument and adopt the fingering that best suits it.

THE SLIDE TROMBONE

The physical requirements of the trombone student are fairly even front teeth, medium thick lips, right arm long enough to reach the seventh position without twisting the body, and a very good ear.



Slide Trombone.

I. Equipment and Care of the Instrument.

The trombone requires the same care as the cornet (see page 56), except that the slide must be closely guarded to prevent its becoming dented. A tiny dent in the slide will cause it to stick and will require the services of an expert for repairs. A bottle of trombone oil should be kept in the case and the slide should be oiled whenever the instrument is used. At least once a month both sections of the slide should be cleaned with a cloth saturated with ammonia, a ramrod being necessary for cleaning the outer section and great care must be taken that the end of the ram-rod does not dent the slide. Avoid dust, grit, or anything which would cause scratches or friction between the sliding surfaces.

II. How to Hold the Instrument.

Put the instrument together so that the cross piece connecting the slide section is at right angles with the cross piece connecting the bell section (see picture).

Slide Trombone.

Grasp the instrument with the left hand so that the thumb hooks around the cross piece of the bell section, the index finger rests on the shank of the mouthpiece and the remaining three fingers hook around the cross-piece nearest the mouthpiece (see picture). Grasp the cross-piece connecting the movable part of the slide section with the thumb and the tips of the three middle fingers of the right hand.

III. How to Produce a Tone.

(See Cornet, page 56).

IV. How to Tune the Instrument.

Play *do, so, do* and tune the high *do* to the Bb below the middle C on the piano, or tune *ti* below high *do* (slide extended three and one-half inches) to A on the pitch-pipe, the tone of the trombone sounding one octave lower than that of the pitch-pipe. The tuning crook is located in the end of the bell section. See cornet, page 57.

V. How to Vary the Pitch.

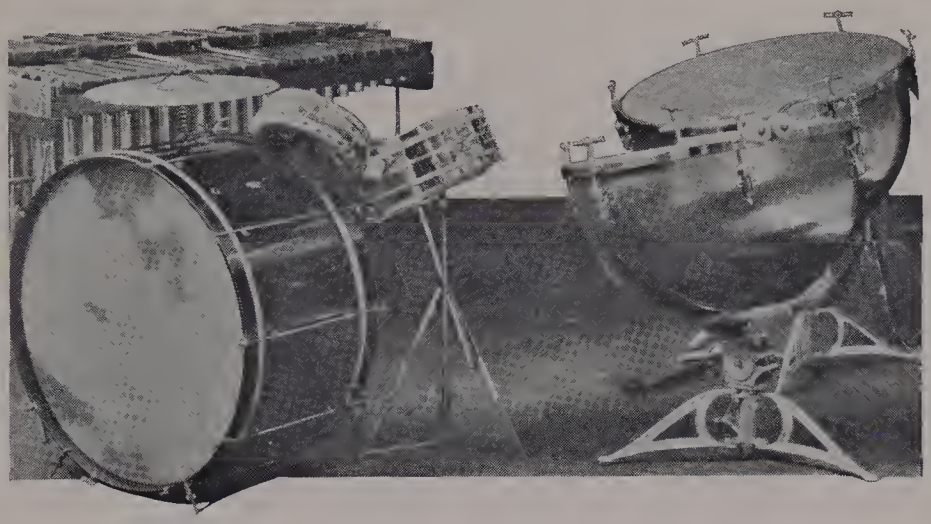
The open tones correspond to those of the cornet and baritone. See cornet, page 57.

The slide takes the place of the valves, on the cornet or baritone, in bridging the gaps between the open tones, the seven positions of the slide corresponding to the seven different combinations of valves on a valve instrument. When the slide is drawn in as far as possible toward the mouthpiece it is said to be in the *first position*. When it is pushed out three and a half inches it is in the *second position* and the tones produced will sound a half step lower than those of the first position. Each three and a half inches that the slide is extended lowers the tone one-half step.

Learning to adjust the slide with speed and accuracy takes much practice and care must be taken to avoid too much slurring on the one hand and too much staccato on the other.

TYMPANI OR KETTLE DRUMS

The kettle drums are the only drums capable of giving a definite pitch, and are therefore far more useful than the other instruments of the percussion family.



Xylophone. Drums and Crash Cymbal. Tympani.

I. Equipment and Care of the Instrument.

The drums should be kept in trunks or boxes when not in use. They should never be allowed to stand in a dry heated room for any great length of time, or the heads will dry out and split. Striking the heads with pointed instruments, however lightly, is likely to puncture the heads. The tension of the heads should be uniform all the way around and the heads should be dampened with a wet cloth or sponge occasionally to keep the tone "alive." When the instruments are put away the heads should be only partially loosened or they will lose their elasticity. The player should have at least two pairs of beaters, one of soft wool and one of felt, the former for muffled sounds and the latter for sharp, distinct sounds.

II. How to Hold the Instrument.

The player should stand. The drums should be placed on platforms or stands so that the heads are on a level with the hips of the players. The smaller drum is placed on the right and the larger one on the left of the player, with a few inches of space between them. The sticks are held between the first and second fingers and the thumbs while the third fingers act as levers. By drawing the third finger toward the palm of the hand the stick is made to give a quick sharp stroke.

III. How to Make a Roll.

The strokes are controlled by the third finger of each hand. Lift the sticks high and allow them to drop alternately; slowly, at first, then with increasing speed until the effect resembles distant, rolling thunder. Practice the roll very softly near the edge of the drum-head and increase the loudness by raising the sticks higher and by striking nearer the center of the drum-head. The best tone is made by striking the drum-head six or seven inches from the edge. The single stroke roll is the best for the kettle drum, though some players use the double stroke roll (see snare-drum).

IV. How to Tune the Instrument.

This is the taxing part of kettle drum playing, for the tone is so indistinct that it requires an excellent ear to tell whether the drums are in tune or not. The drums are

usually tuned to *do* and *so* of the key being played, the smaller drum taking the higher tone and the larger one the lower.

The range of the larger drum is F, below the bass staff; to C, second space bass staff; and that of the smaller one, Bb to F in the bass staff.

Tightening the heads raises the pitch. Tune by turning all the screws in succession a fraction of a turn, and not by turning two or three without touching the others. The heads must be kept at an even tension throughout their surface, or the tone will be "foggy." The drum player must have a very keen sense of pitch. While he, of course, can tune his instruments before the orchestra begins to play, he is frequently called upon to retune them to a new key in the middle of a selection and he must do this quietly enough not to disturb the music going on around him.

OTHER INSTRUMENTS OF PERCUSSION

Care in choosing pupils well adapted to the work of this section more than half solves the problem. Piano students who read well soon become good drummers.

In school orchestras it is unwise to allow one drummer to play more than one instrument and thereby cheat other pupils out of the opportunity of playing in the orchestra. Reading the music for, and playing three or more instruments at the same time, is a big job even for a professional player. Pupils who attempt it are almost sure to become "fakers" who play by ear and chance. "Trap" drummers who play all the percussion instruments, are only useful in jazz bands and orchestras where the object is to make the most noise with a minimum number of paid players.

THE BASS DRUM

This instrument should be placed on a platform or stand so that the top of it is about forty inches from the floor. The player should stand erect. The beater is held in the right hand and the drum-head is struck with glancing blows at a point distant about one-seventh of the diameter from the edge.

A bass drum roll is made by holding the beater in the middle and striking with both ends alternately, for which purpose a special beater may be procured.

In marching the drum is held by a strap or harness.

THE SNARE DRUM OR SIDE DRUM

This instrument is placed on a special stand or on a chair, for orchestra, and strapped to the belt of the player for marching. The sticks are held loosely balanced between the thumbs and fingers with the left hand turned palm up and the right hand turned palm down.

To learn the roll, strike the drum-head with each stick alternately, allowing the sticks to rebound so they strike the drum-head twice with each movement of the hand. Begin slowly and increase the speed until it sounds like hail falling on a tin roof. This requires much practice and silent practice on a copy of a magazine placed on a chair will produce excellent results without annoying anyone.

CYMBALS

The cymbals are held by handles or straps down through the opening. The player stands and strikes the cymbals together with a glancing blow, allowing them to glance apart and continue to vibrate. Staccato effects are produced by not allowing them to glance apart after striking.

TRIANGLE

The triangle is suspended by a string (not a wire) and struck with a metal bar. The roll or tremolo is produced by a rapid vibrating motion of the beater in the bend of the triangle so that it strikes the two sides alternately.

BELLS

The bells are arranged in the same order as the keys of the piano with those corresponding to the black keys in the upper row. The player should have a pair of soft rubber hammers and a pair of metal hammers. A pianist is able to master the bells in a very short time, practice being all that is required.

XYLOPHONE

The xylophone is played in the same manner as the bells.

TAMBOURINE

For staccato effects the tambourine is held horizontally in the left hand and tapped on the knee or knuckles of the player. To make a roll, hold the instrument horizontally in the left hand, moisten the end of the right thumb and rub the tip against the edge of the head of the instrument with a backward movement.

THE CASTANETS

If the castanets are mounted on a handle, they are merely tapped against the knee of the player. The simple type of castanets, those without the handle, are held between the thumb and index finger of the right hand and usually tapped against the knee.

OTHER PERCUSSION INSTRUMENTS

Various other instruments, called traps, are included in this category, such as bird whistles, gong, wood blocks, sirens, etc., in which the method of operating is self-evident. These instruments are rarely needed except in occasional descriptive pieces.

CHAPTER FOUR

CLASS PROCEDURE

Before discussing class procedure let us briefly review our pedagogy and see if we follow it correctly. The pupil is going to study music seriously. He can read music vocally, knows the songs he is going to play and how they should sound, but he is going to use a new medium for performing them. This new medium is the instrument.

Returning to the pedagogical maxim "Proceed from the known to the unknown," apply as follows: The known is the song, the unknown is the new instrument. "We learn to do by doing" is another saying to keep in mind. What is he going to do? Use the new instrument to express the music he already knows. So, just let him do it. What does he need to know to start playing? He needs only to know where *do* is on his instrument and then he may start at once to find out where the rest of the tune is. This information the teacher will give the class by sounding *do* for the piece they are to begin with, and then letting the pupils find it on their respective instruments. When all have found it, the teacher may start them to playing the first song.

Playing by Ear.

These pupils are going to "play by ear" for some time and the whole success of the class system depends upon the proper use of this "ear work." The ear is the organ that makes music possible, and its systematic development and application to the playing of instruments, must begin at once and never be laid aside.

Mistakes.

The player will make many mistakes and the temptation will be to hesitate and try to correct every error; but this tendency must be nipped in the bud. Teach the pupil to play right along as long as it is in time; accuracy will come later. This may sound like false doctrine, but let us see if it is not the right thing to do.

Music Reading.

Instrumental music is made up of *tone, time, notes* and *expression;* and the pupil should bear in mind this logical order. If he is able to do but one thing, it must be to make his instrument sound something, no matter what the sound is. If he can do two, it must be *tone* and *time*.. A mistake in time is noticed by everyone. Besides we are training the pupil to think rapidly and rhythmically. If a pupil can do three at the same time, these must be *tone, time, notes.* If he is a perfect sight reader he will be able to do all four simultaneously. This is the logical sequence of music reading and the pupil should always follow it if he hopes to become a good musician.

Choice of Music.

The more dignified the music and more interesting the harmony, the better the pupils like it. Teachers often make the mistake of giving the pupil music that is too childish and harmonically thin, and still more often, music that over-emphasizes the rhythm and accents. Pupils will like this if they have had no chance to hear and make harmony, but they will respond to the harmony far more intensely than to the other if given the opportunity.

The drums and other percussion instruments are very important parts of the orchestra, but they are a menace when introduced too early and made to over-emphasize the rhythm, as is so often done.

Much of the simple orchestra music consists of nothing but the tune with an accompaniment of after beats and drums. This gives the players no chance to hear real harmony.

If the harmony of the simple music is brought out before the drums are added, the pupils will get an earlier vision of what harmony means in music. Growing up in the orchestra and instrumental classes with this balanced outlook on music, the coming generation will be less jazz-crazy than the present.

Order is heaven's first law; and it should apply to music classes of every kind and very especially to the instrumental class of beginners where there is such a chance for unnecessary noise and wasting of time. The following class procedure is suggested, not that it is perfect nor that the teacher should follow it slavishly. It has been used with success and it is offered as a pattern.

Stringed Instrument Class.

The "Universal Teacher" will furnish the music necessary to carry on the class, and this course is recommended to the teacher.

The class may number as many as the skill of the teacher permits. A good teacher should be able to handle any number up to twenty-five or thirty; though unless very strong and experienced, ten or fifteen will be found the best number. All the stringed instruments may be taken into one class as the music has been arranged to accommodate them all, or any combination of them. It is to be hoped that they will all be represented in the class. One of the principal reasons for making up this course was the fact that there are plenty of classes for violinists, but the unfortunate pupil who wishes to learn the cello or bass has to take private lessons or go to some distant center where enough cellos or basses can be brought together to make up a class. He has usually the added misfortune of not being able to play his instrument with different instruments and thus satisfy his desire for harmony early in his musical pilgrimage, and receive the necessary drill in ensemble playing.

Time of Class.

The class should meet once or twice weekly for an hour. If held during school time there will be fewer interruptions and the class will be more regular in its work. Credit should be given for it the same as for any other subject, time for time.

The following plan reduces interference with other school work to a minimum. We will suppose there are four instrumental classes in the school and the teacher comes to the building every Tuesday forenoon. The classes are numbered 1, 2, 3 and 4. On the four Tuesdays of each month the classes meet as follows:

Hour	8	9	10	11	Day
Class	1	2	3	4	First Tuesday
Class	2	3	4	1	Second Tuesday
Class	3	4	1	2	Third Tuesday
Class	4	1	2	3	Fourth Tuesday

This plan allows the pupil to miss each of four regular classes once a month, which he may readily do with little or no detriment to his other school work. Thus it is easy to put the instrumental classes in school time as the rest of the program may be ignored, instead of attempting the hopeless task of arranging each child's program to suit the instrumental class.

Personnel of Class.

Pupils should be admitted from any grade if large enough to handle the instrument and able to read vocal music a little. This latter is quite desirable for the progress of the pupil who can already read vocal music is far more rapid than that of the pupil who has to learn music reading and the technic of the instrument at the same time. However, the teacher should not exclude from the class those who cannot read music. He may give these a little more time and they will soon be able to keep up with those who can already understand music.

Play Songs First.

It will be seen that all the music in the "Universal Teacher" is made up of songs the pupil has previously learned, or at least heard. When learning a new thing, the pupil should use an old medium. The old medium is the familiar song, the new thing in this case is the instrument.

Instrumental teachers of all kinds are very prone to ignore this sensible plan. They lift the pupil bodily from a musical environment with which he is already familiar, and plunge him suddenly into a type of music totally strange, which often seems to him to consist of everything but the thing he hoped to make with this new instrument—MUSIC. He becomes discouraged and loses interest; whereas, if he could only play some of the old tunes at once, he would be making music—well liked and familiar music; and his interest, thus sustained, would carry him over the troubles incidental to the new medium.

This feeling is stronger than we often suspect, as is shown by the following story told about David Mannes. Looking into a neighboring studio he discovered a large colored washwoman discouragedly toiling over scales and five-finger exercises on the piano. Mr. Mannes, by questioning her, discovered this to be her ambition: "If Ah could jes play "Nearer My God To Thee," Ah'd be puffickly happy. Mah teachuh says if Ah practices mah exuciziz foh two yeahs, Ah maybe can." Sensible Mr. Mannes said, "Why not play it now?" He then sat down and taught her to play it and sent her home rejoicing.

Arrangement of Class.

Each pupil should of course have an instrument, either his own or one loaned by the school.

There should be a chair for each one playing the violin, viola or cello. The bass players must, of course, stand. The chairs should be placed in order before class time. They should be far enough apart to permit one to pass freely between them and to allow each pupil space enough for the sound of his own instrument to reach his ears a trifle more clearly than that of the others, but not too loudly for him to hear the others.

Each pupil should have a music stand and a book. The stand should be furnished by the school. It should have a heavy bottom, adjustable as to height and angle of the desk, with solid back so that the music will not slip through. Each pupil should have a book and music rack of his own also for home practice. Pupils should sit in straight rows or according to some symmetrical plan so that the teacher as he stands in the front of the room may be able to see at a glance what each pupil is doing.

The pupils of the stringed instrument class should be seated by trios; for very soon they will be playing music arranged for three parts. These trios should be seated according to some plan convenient to the size and shape of the room. The different instruments should be in trios together a part of the time. For example, suppose there are nine violins, six violas, six cellos and three basses in the class. There would be three violin trios, two viola trios, two cello trios and one trio of basses. Some of the time the trios should be of mixed instruments. The pupil on the right of each trio would be numbered *one*, the middle one be numbered *two* and the other one *three*.

Pupils should enter the room quietly, take their seats and get ready in the shortest possible time, putting their instrument cases under their chairs to prevent their being stepped on.

Quiet Room.

The instrumental class must be quiet and orderly. Special effort must be made to reduce the noises to those that are actually necessary. The music pupil must have keen ears. If he is trained to keep his class room quiet, his ear will learn to distinguish faint sounds and this habit of sharp discrimination will help his music. If his ear is so dull that it will

tolerate harsh sounds in the music class, his chances of becoming a keen-eared musician are small. Every music pupil should join the society for the suppression of unnecessary noises the moment he begins to study.

Attention.

The attention of the class must be good. Not a sound of tuning, not a movement should be heard when the teacher speaks to the class as a whole. The constant picking of strings and soft tooting on the horns that goes on in many classes and orchestras while the leader is speaking or when someone is tuning, should never be allowed. There must be fine organization in this regard or there will be bedlam instead of order, and the teacher will develop the vicious habit of telling the same thing twice, than which no better plan to destroy attention has ever been devised.

The teacher must pay close attention to the class all the time so as to know when to help and when to drive. At times more advanced pupils may be detailed to help those who are struggling. A pupil often learns more from another pupil than he does from the teacher.

Planning the Lesson.

The teacher should plan each lesson very carefully in advance. This seems like superfluous advice; but so many teachers conduct their classes on the inspiration of the moment. No matter how experienced or skillful the teacher, this is a very poor way to do; for it results in much delay and lost motion. The lesson drags; necessary things are overlooked, and the pupils do not get what they should from the lesson.

The teacher should place the program of the lesson on the board before the class enters. They may look at the program of the lesson and arrange their music in accordance with it, thus saving time.

The Piano.

The piano should not be used in the class lessons. The reasons are given in the chapter on "Intonation." There may be a piano in the room for tuning but it should not be used for anything else. It is usually an effective means of covering up mistakes and producing dependent players. It dominates the ensemble entirely too much. There is no piano part in the "Universal Teacher." It is hoped that this omission will help to banish the piano from school orchestras, for the different instruments of the class furnish harmony almost from the very beginning.

Mirror.

A large mirror is a great time-saver for the class. If a pupil does not get the correct position, he may be sent to the mirror and compare his position with that of the picture in his book. This will teach the pupil how to look after his own position, both in the class and when practicing at home.

Attendance.

A record of the attendance should be kept very carefully. The teacher should have a seating diagram with pockets such as are sold at school supply stores. Little cards with the pupils' names on them slip into these pockets and when a pupil is moved from one place to another in the class, his card can be moved likewise. A glance at this diagram will tell who is absent.

Practice Cards.

Each pupil should have a practice card similar to the one reproduced below. This card should be placed where the teacher may inspect it while the pupils are playing.

PRACTICE REPORT. .....School.

Pupil ..... Month ending....., 19.....

		Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
LESSONS	1st Week							
Teacher	2nd Week							
Insert	3rd Week							
Date of Lesson	4th Week							
PRACTICE	1st Week							
Parent	2nd Week							
Insert	3rd Week							
No. of Hours	4th Week							

Signatures

Instrument or Voice..... .....Parent.

Room..... .....Teacher.

Position Drills.

Position drills should be given the pupils of this class. Drills of all kinds should be used very sparingly but when they are needed they should be given just enough to teach what is wanted and then dropped. When by these drills the pupil has been taught how to hold his instrument in the right way, the teacher should drop the drill and hold the pupil to the point, letting him correct his position from time to time before the mirror. See pages 35 and 36 for these drills.

Tuning.

Tuning the instruments is very necessary and pupils should learn to do this very early in their work. The teacher is referred to the chapter on intonation for ideas about tuning the different stringed instruments. It is here that teachers are very careless, for many really believe that pupils are unable to tune their instruments and so do not teach them to try early enough. Experience has shown us that very young pupils can learn to tune their instruments, and that trying to do so is a very valuable form of ear training. A great deal of early attention should be paid to this.

Routine.

There should be some system to follow in doing anything that has to be done repeatedly and the music lesson is no exception. This is efficiency. The most direct routine should be adopted and then used habitually. With a good routine, the pupil knows just what to do without prompting, and his mind and that of the teacher may thus be occupied wholly with the subject matter, and the entire time of the lesson be efficiently used.

Routine for Tuning String Class.

Teacher sounds A on pitch pipe or piano. Pupils all sing *do* to this tone, sustaining it while they pick the A string and turn the peg until the tone of the instrument matches the voices. Bass players touch the one-fourth mark on the A string and tune the resulting harmonic to the vocal tone using the bow instead of picking the string. Each pupil stops picking as soon as his string is in tune, but keeps sustaining the tone until all have tuned

and ceased picking the strings. When the A strings are all tuned, the pupils call the A *so*, sing down to *do*, and tune the D strings in the same way. When the A strings are all tuned, the pupils call D *so*, sing down to *do* and tune the G strings. Violins and basses stop. Violas and cellos call G *so*, sing up to *do*, and tune the C strings. Violas and cellos stop. Violins and basses pick A string, call it *do*, sing up to *so* and tune E strings.

The octaves will be different for the respective instruments, as the teacher will readily see, and while the pupils are tuning, the teacher should walk among them and check up their work. This routine, like all other routines, should become automatic and proceed without guidance from the teacher after the first tone is sounded.

Routine for Concert and Individual Work.

When the pupils are ready to begin playing new music in concert, the teacher sounds *do* and says "Class." All sing the piece through by syllable, once, then sing and play it through again and again without losing a beat between repetitions. When the teacher wishes the class to take up the next song he says "Change." Without losing a beat the class sing the next song once and then sing and play it over and over as they did the first one. If the second song is in the same key, the teacher need not give the pitch. If it is in a different key, the teacher must give the pitch quickly, and the pupils must start the new key without losing a beat.

When the teacher wishes individual work he may say **"Next,"** and the pupil whose turn it is, plays without losing a beat. When the teacher wishes the class to resume concert work, he says **"Class"** and the class plays without losing a beat.

The teacher must give the orders **"Next", "Class"** and **"Change"** in a loud, distinct tone, with his face turned toward the class so that every pupil will hear. He must also give an order one or at most two beats ahead of time and be sure it is obeyed in exact rhythm.

Individual Work.

Pupils should learn to play individually, listen to others and profit by their work. Some routine of individual work should be adopted and always followed so that no time is wasted. For detailed suggestions, the reader is referred to the chapter on "Individual Singing" in "Grade School Music Teaching" by T. P. Giddings.

When the teacher says **"Next"**, two pupils at the end of the class rise, one to play and one to wait. The first plays a phrase and sits, whereupon the third pupil rises; thus keeping two pupils on the floor at all times (cello players do not rise, and of couse the bass players are already standing).

If the first player plays the phrase correctly, the rest of the class without being told repeat the phrase in concert, by way of affirmation. The next player plays the next phrase and so on until the teacher says **"class"** and concerted work is resumed.

If the first player does not play the phrase correctly, the second player tries it, and so on around the class until someone succeeds, whereupon the class approves by repeating it. There is a limit to the profitable number of times a phrase should be repeated. Experience has taught that the class should play the phrase usually after three unsuccessful trials, and the next player go on with the following passage.

Individual work should take up a third of the time of each class lesson. The teacher must be very careful to keep the rhythm of the lesson going WITHOUT LOSING A BEAT between trials. The above suggestions for routine may be changed to suit the progress of the pupils, at the discretion of the teacher.

Individual Work by Trios.

The music in Part Two of the "Universal Teacher" is arranged to be played in three parts. The class should be seated in trios composed of the same or different instruments,

as stated on page 70. At the command **"Next"** two trios rise, one to play and one to wait. Each trio plays a phrase and the routine for trios is exactly the same as for individual players. If the pupils doing individual work do not keep the rhythm of the lesson going correctly, the rest of the class may sing to remind them how the lesson should go.

The music of Part Two of the "Universal Teacher" is arranged in three parts. Each piece is marked with the figures 1, 2 and 3. The class should be arranged in trios in some symmetrical way, and each pupil in each trio should be numbered 1, 2 or 3. The music can be played either in concert or by trios; and it will make harmony if the pupils all begin playing at the same time, those numbered 1 beginning at the figure 1, those numbered 2 beginning at the figure 2 and those numbered 3 at the figure 3, and all playing to the end of the piece, then beginning at the beginning of the piece and repeating as many times as the teacher desires, each ending where he started.

This music may be treated as a single melody and all the pupils begin at the figure 1 and play in unison but this is not a good plan. They should play in harmony, as stated above, the very first time they try the piece. If found impossible to learn the piece in this way, unison playing may be tried only as a last resort.

The pupil will of necessity use this music as single melodies in his home study unless he practices with two or more other pupils. He will doubtless prefer the latter plan, and he should be encouraged to do this as much as possible to develop his harmonic sense and his ability to play with other people. This plan allows the pupil to use his instrument both in solo and accompanying work in each selection. He thus grows up with a well proportioned idea of the usefulness of his instrument.

Singing.

The pupil should sing with a perfectly smooth, soft tone. This develops a keen ear and a high standard of musical taste which will make him critical of the instrumental tone quality and intonation. The pupil may sing as he plays some of the first songs so that he may compare the singing tone with the instrumental. The singing is useful only to enable the pupil to make the transfer from vocal to instrumental music. When this is done the singing should be dropped with occasional returns to it on difficult passages.

The pupil should not try to sing higher or lower than he comfortably can.

Assigning Lessons.

Each pupil should copy the assignment of the next lesson from the board on his practice card. There will then be no misunderstanding. Plenty of work should be given. Music teachers are very prone to assign too little material for home practice, forgetting that it is the quantity of music read that makes the good reader, and that a pupil will acquire technic just as well on new material as on old. It is far better to assign too much than too little.

Additional Material.

The teacher should also suggest that in addition to the work assigned the pupil find other music, learn it and play it for the class. Teachers often misguidedly discourage this tendency on the part of their pupils. Whatever will make a pupil reach out and find practicing to do should be welcomed and not discouraged. A pupil will sometimes select music that does not meet the approval of the teacher, who should not be too fussy at first, remembering that a pupil seldom becomes suddenly addicted to Bach, but that there are times when the other great B. (I refer to Irving) will start a pupil on the upward musical climb.

Let the Pupil Try.

The teacher should never be guilty of the prevalent reprehensible practice of going over the music of the next lesson with the pupil before the pupil has taken it home and tried it

alone. Why is this bad practice? First, what is it the pupil should get, pieces, or power? It is certainly the power to play a new piece of music correctly. The teacher should never forget that his function is to develop in the pupil the desire and ability to learn, unaided. If the teacher insists on going over the piece with the pupil the first time, he robs the pupil of the joy of discovery and independent accomplishment. When the pupil has learned a piece by himself the teacher should hear it at the next lesson and comment on the progress the pupil was able to make alone. This will develop his pride in independence, which is indeed a fine thing for any pupil to have.

The teacher should rarely play with pupils. The teacher very seldom needs to play for them. Good teaching consists in letting the pupil find out for himself as far as possible, and then, as a last resort, the teacher may give him a hint that will help him find what he needs to know.

Outline of First String Class Lesson.

This outline is intended merely to suggest the division of time and order of the various steps:

With older pupils more can be done in the time specified, but with younger children it will take longer.

1. Teacher examines equipment and seats pupils.. .....10 minutes
   (Equipment should tally with list on page 32).
2. Tune .....15 minutes
   (Use routine for tuning string class page 72).
3. Position drill .....10 minutes
   (Use routine on page 35).
4. Bowing drill ..... 5 minutes
   (Page —36).
5. Test tuning routine..... 2 minutes.
6. Begin concert playing first three tunes.....15 minutes
   (Follow routine on page 73).
7. Give out practice slips. Pupils mark next lesson. Pack up instruments 3 minutes

Outline of Second String Class Lesson.

1. Tune .....10 minues
2. Position drill ..... 5 minutes
3. Bowing drill ..... 3 minutes
4. Sing and play first three tunes (familiar) in concert, then individually..15 minutes
5. Sing and play new tunes in concert, then individually.....20 minutes
6. Play familiar tunes in concert..... 5 minutes
7. Copy lesson assignment..... 2 minutes

Next lesson. Copy:

New, numbers 7, 8, 9, 10, 11.
Review, numbers 1, 4, 5.

Program of second lesson to be placed on blackboard before the class begins:

1. Tune .....10 minutes
2. Position drill ..... 5 minutes
3. Bowing drill ..... 3 minutes
4. Familiar tunes—1, 2, 3, 4.....15 minutes
5. New tunes—5, 6 .....20 minutes

6. Review—1, 3 ..... 5 minutes

Next lesson—New, 7, 8, 9, 10, 11.
Review, 1, 4, 5.

Third String Class Lesson.

Program of third lesson:

1. Tune ..... 5 minutes
2. Position drill ..... 2 minutes
3. Bowing drill ..... 2 minutes
4. Familiar—7, 8, 9, 10, 11 ..... 15 minutes
5. New—12, 13, 14 ..... 30 minutes
6. Review—1, 4, 5 ..... 4 minutes
7. Next lesson—New, 15, 16, 17, 18, 19.
   Review, 7, 10, 14.

In following the program the teacher will see that all new work and part of the familiar is played in concert and individually.

Fourth String Class Lesson.

Program to be placed on blackboard before class begins:

1. Tune ..... 5 minutes
2. Position drill ..... 2 minutes
3. Bowing drill ..... 2 minutes
4. Familiar—15, 16, 17, 18, 19 ..... 20 minutes
5. New—20, 21, 22 ..... 20 minutes
6. Review (in concert)—7, 10, 14 ..... 9 minutes
7. Next lesson—New, 23, 24, 25, 26, 27.
   Review, 16, 19, 22.

Wind Class.

Everything that has been said of class procedure for the string class applies to the class of wind instruments with the following exceptions: no position drills are necessary; the teacher should see that the pupils sit in proper position and have them check this from time to time with the mirror; the tuning of these instruments for orchestra work is given in Chapter 3; it will, however, be easier for the wind instrument class to adopt the band system of tuning which is as follows:

Band Tuning Routine.

Teacher sounds Bb from pitch-pipe or piano. Players match that tone, using the fingering given below and moving tuning crooks as given in Chapter III. Teacher goes about among the class, helping when needed. As soon as a pupil brings his instrument to the proper pitch he stops playing and holds the tone with his voice until all are tuned. Then all hold Bb and perfect the tuning by eliminating any beats that may show, as suggested in the chapter on "Intonation." At intervals during the lesson the teacher should tap once as given in the chapter on "Intonation" and the players should hold the tone and test their tuning. Pupils should constantly strive for perfect intonation in this class especially.

Fingering for Tuning.

All Bb brass valve instruments, open.
All Eb brass valve instruments, open.
All F instruments, first valve down.

Bb clarinets and Eb saxophones, three fingers and thumb down.
Oboe, C saxophone, flute, two fingers and key down.
Bb saxophone, second finger down.
Bassoon, five fingers and key down.
Eb clarinets, 6 fingers and thumb down.

Breath Control.

It is very necessary that the players of wind instruments understand how to breathe properly. The breathing is about the same as that used by the good singer, with the added pressure the instrument sometimes requires.

The teacher must insist on the proper position of the player. This should be as follows. Feet flat on the floor, body erect, chest up, without rising and falling, body poised forward slightly. Inhale with combination of rib and abdominal muscles. Exhale slowly with the abdominal muscles first, letting the rib muscles contract slowly when necessary. This is correct for both the singer and the wind instrument player. The unfortunate practice of chest breathing taught by so many physical culture teachers should be avoided.

The wind instrument player is even more likely to expel his breath in little disconnected puffs than the singer is, and the result is just as bad. It is as important that the wind instrument player exhale his breath slowly and smoothly and inhale only at the end of a phrase as it is for the singer. Pupils who have been taught to sing properly have little trouble with breathing and phrasing when learning a wind instrument, if the teacher insists that they use the breath just as in singing and make the instrument give the same smooth tone the voice does.

All of the wind instruments require whispered articulation of the syllable "too" to make the tone distinct, but it is well to have the young players play the simple songs with one whispered "too" for the whole phrase, or slur, a good deal of the time, until they can use the same steady smooth breath and produce the same smooth tone from the instrument they already use in singing. After the class has sung the tune by syllable let them sing it again with absolute smoothness with one "oo" for each phrase, to show the contrast.

It is a good plan for part of the class to sing with one "oo" for each phrase while the rest are playing once in awhile, also as a pattern for the players. The class may occasionally do the same when a pupil is playing individually. This device is to be used only long enough to enable the pupils to learn smooth playing and its accompanying correct management of the breath.

First Lesson, Wind Class.

1. Teacher examines instruments and seats pupils ..... 16 minutes.
2. Teacher sounds do (Bb) and pupils match the tone and sustain until the resulting union is smooth and in tune. Teacher passes about among pupils to see that the fingering is correct ..... 8 minutes.
3. Class sing first song by syllable, then repeat it, singing one "oo" to each phrase with a perfectly smooth tone. Then play the first song imitating the last singing of the song with the instrument, finding the fingering as they play. Rhythm must be steady ..... 20 minutes.
4. Individual work on first tune ..... 13 minutes.
5. Give out practice slips, pupils copy next lesson assignment, pack up instruments, etc. ..... 3 minutes.

Second Wind Class Lesson.

1. Tune ..... 5 minutes.
2. Breath drill: Sing with "oo", then play without articulating, or with

the slurred "oo" to each phrase, number 1 ..... 5 minutes.
3. Sing and play in concert and individually familiar tunes, 2, 3, 4, 5..... 20 minutes.
4. Sing and play new tunes, 6, 7, 8 first in concert, then individually.... 20 minutes.
5. Review in conert, 3, 5..... 8 minutes.
6. Next lesson. Copy: Breath Drill, 5.
New, 9, 10, 11, 12.
Review, 7, 8.

Program of second wind class lesson to be placed on the blackboard before class begins:
1. Tune ..... 5 minutes.
2. Breath drill, 1..... 5 minutes.
3. Familiar, 2, 3, 4, 5..... 20 minutes.
4. New, 6, 7, 8..... 20 minutes.
5. Review, 3, 5..... 8 minutes.
6. Next lesson. Copy. Breath drill, 5.
New, 9, 10, 11, 12.
Review, 7, 8.

Third Wind Class Lesson.

Suggestive program to be placed on the blackboard before class begins:
1. Tune ..... 5 minutes.
2. Breath drill, 5..... 5 minutes.
3. Familiar, 9, 10, 11, 12..... 20 minutes.
4. New, 13, 14, 15..... 20 minutes.
5. Review, 7, 8..... 8 minutes.
6. Next lesson. Copy: Breath drill, 12.
New, 16, 17, 18, 19.
Review, 10, 13, 15.

Fourth Wind Class Lesson.

Suggestive program to be placed on blackboard:
1. Tune ..... 5 minutes.
2. Breath drill, 12..... 5 minutes.
3. Familiar, 16, 17, 18, 19..... 20 minutes.
4. New, 20, 21, 22..... 20 minutes.
5. Review, 10, 13, 15..... 8 minutes.
6. Next lesson. Copy: Breath drill, 17.
New, 23, 24, 25, 22.

The routine for individual and concert work should be followed through all the lessons. All new tunes and some of the familiar tunes should be played individually as well as in concert. The teacher should train himself to follow the time division of the lesson program even though some of the material remains unplayed because the efficiency of the class method depends upon the ability of the teacher to cover every essential phase at each lesson.

CHAPTER FIVE

INTONATION.

Correct intonation means singing or playing in tune. Without perfect intonation concerted music is a season of sorrow to listener and performer alike and is a menace to all concerned. Playing or singing out of tune will not permanently injure the aural membranes but pupils who are allowed to do this grow up with low ideals of the beauties of concerted music.

It is very true that beginners are unable to play in tune but this is no reason for not making an early and positive effort to teach them how, in the best and shortest way. Multitudes of music supervisors allow their classes to sing out of tune, then lay it to fate that so many of them are earless, make the tuneless ones shut up, waste their time on all sorts of so-called ear-training devices, never make a sensible effort to teach their pupils to sing in tune, and omit teaching the one thing that will enable their pupils to make pure harmony, that third and most beautiful part of music.

Let us go back to the beginning. What does it mean to be "in tune"? Musical sounds are vibrations. These vibrations occur with perfect regularity if the tone is steady. For a given pitch the number of vibrations per second is exactly the same no matter what the vibrating body that starts or produces the tone.

First Steps in Ear Training.

When two or more tones made by different instruments sound just alike in pitch they are produced by exactly the same number of vibrations per second. This is called a unison. A perfect unison is the first thing a pupil should learn to recognize. Then he is ready to recognize the perfect concord of tones of different pitches properly distant from each other. These are the first and most important steps in ear-training, but they are the ones usually left to chance or ignored altogether. The third step is remembering the sound of correct distances or intervals. This last, very self-evidently necessary step, is the one that teachers usually drill upon first. It is very important and should be drilled upon a great deal; but without a positive knowledge of the first two steps all the work on distances and intervals will be valueless for it will never be accurate. With the ability to tell exactly whether tones are in perfect unison or harmony the pupil has a check always at hand to tell whether he has hit the exact distance or interval or not.

There are a number of students who hear unisons and concords and who can gauge distances and who do not have to be taught, except to analyze just how they do it. These are the few who are said to have good "ears" and these are usually told to study music and others are discouraged. Many more can learn to do the same thing and develop a musically accurate ear, if they are trained properly and know just what to listen for when they try to sing or play in tune. In fact those who cannot learn to do this are very few. Indeed it is so very easy to train pupils to sing in tune that nearly every one can be trained to do it if the music is slow and smooth at first. Later rapid music will be sung perfectly in tune by a very large majority of pupils.

Teaching pupils to play and sing perfectly in tune greatly enhances their liking for music; for when the harmony is perfect they are keenly alive to the beauty of it all and will work all the harder and their musical appreciation will rise far higher. Indeed perfect intonation (and the ability to hear it) is the real key to music appreciation. Without it that noblest phase of music, harmony, is a sealed book.

For example, everyone who has heard the St. Olaf Choir admires their wonderful singing. Wherever they appear they are usually greated with crowded houses. Musical and unmusical alike marvel at and revel in the music they make. Why is it? There are a number of elements that go to make up this fine ensemble, but the foundation of all, without

which the other elements would count for little, is their perfect intonation. They learn to blend their voices perfectly as to pitch, power and quality. The good musician of any kind does the same. Instead of leaving this perfection of intonation to chance, then, let us be more definite in our teaching and teach our pupils at the very beginning just what to listen for and just what to do to make their intonation perfect.

First, get away from the piano as that is never in perfect tune. We will not discuss the reasons. A book on acoustics will tell those. The piano has no place in perfect music and that is why good orchestras and choruses do not use it. The best place to learn to sing or play in tune is in the physics class in high school or college. However valuable a full course in acoustics may be, any teacher of music can, in a very few minutes, show a class of pupils all they need to know about the interference of sound and thus teach them exactly what to listen for.

Interference of Sound.

What is interference of sound? Briefly this. Let us, for example, sound a tone that has 440 vibrations per second. If the tone is steady it has just that number of vibrations each second and is perfectly smooth. If another tone is sounded with it that has 439 vibrations per second, a curious thing happens. The combination tone will be louder part of each second and will partly die away once in each second, making a variation in the power of the tone once in each second. This variation is called the "howl", the "whine", the "pulsation", the "beat" and several other things. We will call it the "beat" for want of a better term.

Now, if two tones are sounded, one giving 440 vibrations and the other 438 per second, this re-enforcement and dying away or "beat" will occur twice each second. The farther apart the tones the more rapid the "beats", and there will be as many each second as the difference in the number of vibrations per second of the two tones.

Beats.

The next thing to do is to teach the pupils to hear these "beats". An instrument called the ometer will do this best but this instrument is expensive and there are various other good ways of doing it. If the teacher is a piano tuner or knows a little about tuning the piano he may easily teach his pupils to hear beats. To do this, open the front of the piano and stop one of the three wires of a key near the middle of the instrument with a piece of rubber. Then loosen one of the other wires a trifle with the tuning wrench and strike the key. The resulting "beats" will be very apparent and any one can hear them. As the loosened string is pulled up the beats will be slower and disappear, and the tone given by the two strings will be perfectly smooth when the wire is restored to the exact tension of the other. Listening for this perfect smoothness and absence of "beats" is the way to tell whether the unison is perfect or not.

If the teacher cannot use a tuning wrench, he may use a piano that is out of tune and, striking one key at a time, find several that produce beats and, using these as samples, play them each several times for the class. Two violin players may each hold a slightly different tone on, say, the D strings of their violins, gradually bringing them into perfect unison. Two cornet players may do the same thing. Two trombone players are even better as the tones are deeper and the "beats" easier to recognize.

Learning to Hear "Beats"

How will the teacher use this? The only thing to do is to teach the pupils to *hear* beats, and then teach them to listen for and *eliminate* them while playing. No matter what the medium used for illustration—and there are many more than the above mentioned—demonstrate very slow beats at first and tell the class just what to listen for. Let each member

of the class close his eyes and wave his hand back and forth with the beats as he hears them. This will show at once whether he really hears the beats or not. Very few will be able to hear them at first. The teacher may now sound the discordant tone again and at the same time wave his hand where the class can see, with the beats. This pointing out the beats, as it were, will help a number to hear them. Next the teacher should sing the tone in a whining, nasal voice making his tone loud and soft with the beats of the sample tones. By exaggerating this, he will be able to show many of the others just what to listen for. Let all shut their eyes and try again. More of them will wave their hands at just the right speed. Then use other tones with more or less frequent beats and many of the class will hear them perfectly and will always afterward know what to listen for in striving to judge intonation. A number will not learn so readily and these should sit at a piano in a perfectly quiet room and hold tone after tone in the middle of the instrument until they can hear the beats readily.

After a pupil has learned to hear beats produced in a certain way it sometimes baffles him to hear them produced by a new combination of tones. For instance, he may be able to hear beats produced by two piano wires but may not readily recognize those produced by a cornet and the piano. He should not be discouraged. Practice with this new combination will soon remedy the trouble and he will soon be able to hear "beats" when they are present in any combination of tones.

The voices in the singing class should now sing the same tone until all beats disappear and a perfect unison results. All the instruments in the classes or orchestra should hold the same tone until a perfect unison results. Next chords must be held until perfect, entire absence of beats being the test. The student should stay away from the piano when studying perfect chords, for there are no perfect chords on the piano.

Let it not thought for a moment that time should be taken from every rehearsal to go through this drill. Not at all. Merely practice until the pupil can hear the beats. When he hears them he should raise or lower his tone a trifle until the beat disappears. He will only be able to do this on very slow music at first. Later he will develop such speed and accuracy that he will be able to sing or play in perfect tune in rapid passages. Pizzicato string passages are hard for beginners to play in tune for the ear has not time to judge and tell the hand to change the pitch on extremely short tones.

Listen for "Beats"

The student must constantly listen for beats and play or sing with a perfectly steady, smooth, long tone so that he will have time to hear the beats, and, having heard them, have time to change the pitch slightly until the tone is in perfect tune. Practicing in this way he will finally become so sensitive to perfection of intonation that he will tolerate nothing else and he will become so expert in remembering the sound of exact intervals and how they are made that he will need to do very little pitch changing on the same tone.

Testing Intonation.

As a further step to perfect intonation, let the leader of any body of concerted singers or players have his musicians pause on chords that are not exactly true. Some signal, such as holding the baton still, if the leader is using one, or one tap on something if the leader is not beating time, will mean that all are to hold this chord until it is perfect, the leader meanwhile calling attention to the offending part or player. When the chord is perfect, let two taps, or a movement of the baton be the signal for all to go on.

If, as often happens, this does not perfect the chord and the different tones of the chord are not in unison, stop the other parts one by one with an outward gesture of the hand, leaving one section sounding and let them hold the tone until the unison is perfect. Then stop them with the outward gesture. Then with a beckoning movement of the hand bring in another part and allow these to perfect their unison. Stop these by the outward gesture and beckon in another part to perfect their unison. When all the unisons are perfected beckon in one part after another, eliminating the beats each combination will produce if the parts do not sound the right interval. When the whole chord sounds perfectly smooth, start the musicians on with two taps.

The taps must be made with something that will give a clear, distinct sound, loud enough to be heard above the music.

This routine of *one tap*, to hold, *two taps*, to go ahead, *three taps*, to stop, waving out and beckoning in the parts, is a very simple and efficient way of enabling musicians to test their intonation, and a very little practice of this kind improves the intonation of any ensemble wonderfully. It is especially valuable with beginners.

Pupils become greatly interested in this work, as they soon see that here lies the way to that perfection of intonation which every musician wishes to attain. Here indeed is the short and certain road to perfect intonation without which music is even worse than "sounding brass or a tinkling cymbal"—a weariness to the ear. Only when the intonation is perfect has the pupil the opportunity to know and appreciate the beauties of true music.

CHAPTER SIX

ORCHESTRAL LITERATURE

The school orchestra leader has, in a sense, a wide field of appropriate musical literature to select from:

1. Methods.
2. Marches.
3. Concert Dances.
4. National and Patriotic.
5. Descriptive Pieces.
6. Popular Music.
7. Songs and Song Forms.
8. Pageants.
9. Light Operas.
10. Cantatas and Oratorios.
11. Selections and Overtures.
12. Symphonies.

1. Methods.

These are books or collections on sale by many publishers, and are intended for use by orchestras, the members of which are beginners. They usually contain some suggestions on the care and handling of the various instruments, simple graded exercises, and easy pieces. The danger is that they will be found especially well adapted for one group of instruments and poorly arranged for another, or that the transition from simple exercises to more difficult pieces will be too sudden. Usually, too, the author or composer seems to have in mind, not a school orchestra, but older players.

After a group of pupils have finished the "Universal Teacher," they are no longer a class, but an orchestra. "The Graded School Orchestra Series," by J. E. Maddy and T. P. Giddings, is the logical and most highly recommended sequel to the "Universal Teacher." This series contains easy, attractive graded material arranged with the melody distributed among the different instruments as much and as attractively as possible. The first violin players are no longer, then, the aristocrats; but the orchestra is a democratic institution, in which every player is of equal importance and every instrument equally attractive.

2. Marches.

Marches are widely used with school orchestras because they are strongly rhythmical, requiring little effort to keep the players together; they contain few, if any, bothersome changes of rhythm, style or key; and are usually of about the same standard pattern in form and composition, requiring little mental effort on the part of either players or listeners to follow and enjoy. Ease and attractiveness combine admirably; they do not admit of as simple treatment as either the method book exercise or selections of the hymn style, but appeal more because of the lively movement.

The greatest drawback in the use of the march is that most composers assign only untuneful "afterbeats" to the second violins, hence the proverbial aversion to playing "second fiddle." Violas and horns or mellophones, etc., usually have a similar part to play, which seems uninteresting in the extreme to the young player who has no knowledge of harmony and has as yet not learned to think of himself as a part of the whole. This, of course, accounts for the usual scarcity of second violins. The leader should make an effort to select music which is written on the harmonic style, with equally interesting parts for the other instruments. In this sort of composition, however, the composer may sometimes find it difficult to maintain the rhythmical interest without making the interweaving of melodies too elaborate, or the movement too monotonous.

3. Concert Dances.

By this is meant compositions in dance form which are for concert presentation but not necessarily suited for accompanying dances. The most popular forms are the waltz, two-step and others. These forms have the same advantages as the march, and the same dangers. Gavottes, minuets and dances with national flavor might be mentioned also. Many

concert dances, however, are quite difficult and require players of ability for satisfactory performance.

4. National and Patriotic.

National and patriotic songs, such as "America", "The Star-Spangled Banner", "Swanee River", etc, can be played by almost any orchestra, or they may be elaborately arranged and worthy of the efforts of the most advanced orchestra. The patriotic medley is always pleasing, but changes of key and rhythm will cause trouble with players of limited experience. Arrangements of songs of other nations also have an educational value.

5. Descriptive Pieces.

Selections which are intended vividly to portray in a musical way scenes at a county fair or on a cotton plantation, a circus, a storm, an earthquake, a zoological garden, etc., etc., are called "descriptive pieces." These have a high value as a feature of a certain class of entertainment program. They will also create intense interest among the members of the orchestra, at least until the members are sufficiently advanced in music appreciation to understand absolute music as distinguished from program or descriptive music.

6. Popular Music.

No orchestra, however great or humble, should be nor need be above playing "popular" music once in a while. Music is great only in so far as it relates itself to life. Unquestionably the World War showed that popular music has a place in life that cannot always be ignored.

7. Songs and Song Forms.

A popular and not difficut form of orchestral composition is the song in its various aspects. Here the cornet or trombone may take the melody, while the strings and woodwinds play the accompaniment. Or there may be a special lesser part for the brasses, in case the song is to be sung by a voice. Old-time favorites, sacred songs, and even more modern songs of the popular type are treated in this way. Allied forms are the barcarolle, the lullaby, the serenade, the cavatina, the romance. Where sufficiently rhythmic interest is maintained, these forms may be used to great advantage when working to develop tone quality, as they call for slow and sustained execution.

8. Pageants.

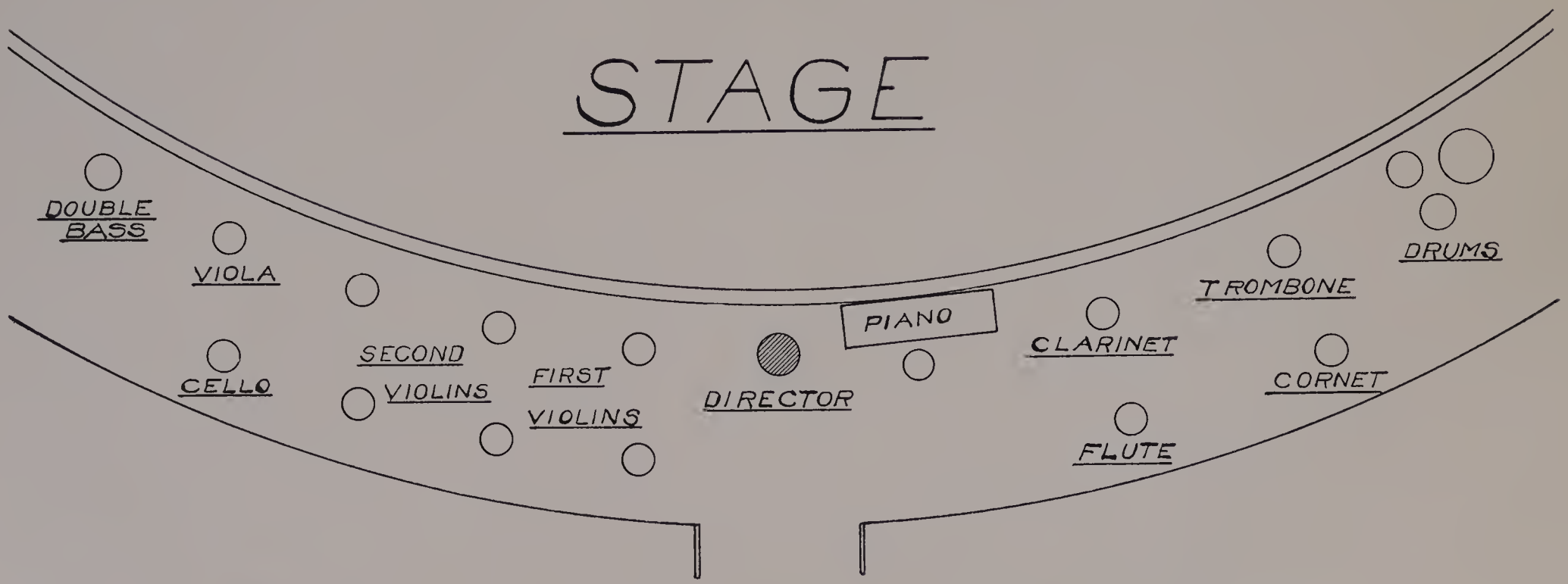
A pageant is the simplest form of dramatic production, so far as the orchestra is concerned. In it the orchestra may be used to accompany soloists or large choruses, or for special dramatic effects. As pageants are often held in large auditoriums or open-air amphitheaters, a large and well balanced orchestra is peculiarly well adapted for supplying the necessary volume and "atmosphere." The music is usually simpler than that of the average operetta, and easier for a young orchestra to handle, being broken up into sections of convenient length.

9. Light Operas.

Under this head come a wide range of compositions, from the simplest children's operetta to the Gilbert and Sullivan standard comic operas and the complicated novelties of the modern stage.

The orchestrations usually are not for sale, but may be rented from the publishers for from five to ten dollars per month. From one to three or more months' rehearsal may be necessary with the average young orchestra.

The utmost care must be used not to drown out the voices. It is not necessary, however, to mute the instruments. With a little persistence they can be taught to play so softly that the lightest solo voice can be heard without difficulty.



CONVENTIONAL SEATING PLAN FOR ORCHESTRA IN OPERATIC PRODUCTIONS.

An opera is a composite production in which the work of the song and chorus trainer, of the coach or stage manager, and of the orchestra director, are all fused into one whole. Sometimes two or three of these offices are filled by the same teacher. But the orchestra leader generally directs both players and singers at the performance. Both, but especially the orchestra, must be so well trained with the baton that following has become a habit. Young solo singers are prone to omit or add beats and even measures; and the director first, and then the orchestra, must be instantly ready to compensate by a corresponding momentary acceleration or retardation.

10. Cantatas and Oratorios.

Under this head also comes a great variety of works. By a cantata is meant a musical production of some length which is to be sung but not acted. Strictly speaking, a cantata is a work of a secular nature and an oratorio is one founded on a sacred or biblical theme. But in popular usage, the term "oratorio" is applied only to the more pretentious compositions such as the "Elijah", the "Messiah", and the "Creation", while "cantata" means almost anything of lesser rank, whether sacred or secular.

As in opera, there are the soloists, the chorus, and the orchestra. The orchestra leader does not necessarily, however, have charge of the whole production; but may thoroughly train the orchestra and turn them over to the chorus leader for the final rehearsals and performance.

Cantatas will usually be found more difficult for the orchestra than operettas of equal merit. The lack of any missing instruments will be felt more keenly than in operettas; so much so that it is advisable to engage professional players to fill the gaps. These, if competent, will need to attend only the dress rehearsal. The orchestra must be well drilled in following the baton, and must understand accompanying recitative, aria and chorus well enough to be prepared for any emergency that may arise during the performance, such as, for instance, the premature entrance of a soloist.

11. Selections and Overtures.

The term "selection" is usually applied to an arrangement together in medley form of a number of themes from an opera. It is usually more dignified than the typical medley, though there is not necessarily any definite line of demarkation between the two.

A definition of overture would read essentially the same, except that the medley idea is less apparent. There is also the purely concert overture which is built on the same principle, though not necessarily founded on an opera.

The overture is well adapted for use as a prelude to or opening number for plays, pageants, cantatas or operas. A fairly large and well trained orchestra is desirable, though not necessary. Many theater orchestras of only ten or twelve players attempt rather elaborate overtures. When this is done, however, it is often necessary for one player to play the part of a missing instrument on his own instrument or even change to other instruments momentarily.

12. Symphonies.

Representing, as it does, the highest form of musical attainment, the symphony is necessarily beyond the reach of most school orchestras at the present time. Many high school orchestras, however, in cities of fifty thousand and over, and some in even much smaller communities where orchestra work has been carried on under highly efficient direction, have given creditable performances of some of the simpler classic symphonies.

Simplified arrangements of some of the best of these have been made, which preserve all the original rhythms and themes, but which make the absence of the rarer instruments less apparent. This places the opportunity for a limited amount of symphonic practice within the reach of a much larger number of orchestras. Public rendition should rarely be attempted except on a recital or special orchestral program, or where the performance is made a lesson in music appreciation by a clear explanation of the symphony as a form and an analysis of the thematic material of the symphony under consideration.

CHAPTER SEVEN

SCHOOL ORCHESTRATION

Every leader ought to be able to write or arrange music for his orchestra. It is frequently necessary for him to supply missing pages on short notice, and sometimes he must prepare a whole orchestration from nothing but vocal score. This involves singling out the notes suitable for each instrument and writing them down in proper form. The ability on the part of the leader so to treat school, class or football songs will assist greatly in the popularization of the orchestra and its work, and increase its usefulness as well.

The labor of acquiring and practicing such ability should not be looked upon as burdensome. For in writing for the instruments, the arranger comes to know their various functions, possibilities and limitations and their relations one to another with an intimacy and thoroughness otherwise hardly possible.

In writing for the orchestra, we will consider: first, the strings as a group by themselves; then the brasses as being next in importance in the school orchestra as a group; then the wood-winds.

Go to a music dealer and ask for a publication for a string quartette. You will be shown an arrangement in which the first violin is to play the soprano, the second violin the alto, the viola the tenor, the cello the bass. Many fine selections are published in this way in chamber and concert music. Were it required to orchestrate a simple hymn, this plan would be followed. The double-bass, if added, would play the cello part an octave lower.

To divide strings into five parts, let the first violin play the soprano; the second violin, second soprano; the viola second alto or a high tenor; the cello, baritone; and the double bass the bass. A more common, but less simple method for writing for the strings is to assign the melody to the first violins, the counter-melody or tenor to the cello; while the bass, second violins and violas merely outline the accompanying chords, the double-bass playing a note on the accented part of the measure, the others the after-beats. This, however, is uninteresting to the second violins and violas.

In the school orchestra, the brass instruments are used to carry independent melodies, to reinforce the melodies of other instruments, to round out the harmony of other groups, or to carry an independent harmony themselves.

The cornet can always be depended upon in the smallest orchestra to carry the melody to the furthest corner of a crowded and even noisy auditorium. In martial music, it is indispensable. Used in duet with violin, trombone or other instrument, it may be not at all displeasing.

The trombone usually divides its time between helping the string bass and singing out on some prominent melodic passage of its own. The exaggerated slur, of which the trombone is capable, is all too often used to attract attention, especially in music of a light or frivolous character. Its fortissimo is overpowering, and its sforzando is almost as startling as any effect that can be produced in the percussion section. In softer passages, too, its light tone in the upper registers is pleasing, often being used as a tenor or baritone soloist in unison with the cello.

The French horn, like its substitute, the mellophone, is an accompanying instrument, its part in many selections being but a succession of single notes interspersed by rests, with little or no melodic interest. The player can enjoy it only as he thinks of the part that he is contributing to the whole. But occasionally it comes to the forefront in a little melody of surpassing charm, or a duet with its brother instrument (they are always supposed to go in pairs) or a single muffled or hissing tone when the player mutes it for dramatic effect, by inserting his hand in the bell.

Writing for the Brass Choir.

Harmonically, the brass choir, like the string choir, should be as nearly independent as the number of instruments present and the nature of the composition or passage will permit. In writing for the brass choir, we may consider any one of the following combinations open to us:

1. A melody for cornet alone.
2. A melody for one cornet and an alto part for the second cornet.
3. A duet for the cornet and trombone. This is often observed in theatre and dance music.
4. A quartette for the cornets, mellophone (or alto) and trombone (or baritone). This combination is very effective and may be used unsupported by other instruments. Many concert numbers are published for this combination alone, or,
5. Two cornets and two trombones may be used in quartette in the same manner.
6. Two, three, or four mellophones in duet, trio or quartette, with or without support from other instruments. But the most common combination is:
7. A melody for the cornet; a tenor part, counter melody or the same melody an octave lower player by the trombone; and intermittent accompanying chords for the mellophones and second cornet. The bass may be played by the tuba.

There is, of course, a much larger variety of possibilities open to the resourceful composer, but these are the ones most used in small combinations; in fact, the wise writer for a small orchestra will write each part, wherever possible, in such a way that it will not be indispensible; but if present, will add to the effectiveness of the whole.

Writing for the Wood-wind Choir.

The possibilities for the school orchestra of limited size may be considered as confined to the use of the flute and two clarinets alone and in combination. They might be partially listed as follows:

1. Flute solo.
2. Clarinet solo.
3. Flute and clarinet duet.
4. Trio for flute and two clarinets.
5. Flute or clarinet obligato for other groups.
6. Flute as melody instrument in unison with or octave higher than violin or clarinet.
7. Clarinet as melody instrument in unison with flute, violin or cornet.
8. Flute and clarinet outline the soprano and alto parts of the harmony, respectively, an octave higher than the same as played by the string or brass parts.
9. Flute as obligato instrument, first clarinet as melody instrument, and second clarinet as accompanying instrument, with other accompanying parts on second cornet, mellophone and violins, bass parts filled in by trombone and strings, etc. This is perhaps the most common method of handling the wood-winds in small orchestras.

The Transposing Instruments.

The clarinet, cornet, trumpet, French horn, mellophone, alto horn, English horn, and band (Db) flute or piccolo are transposing instruments. By this is meant that the tones played do not sound as written. C on the cornet or clarinet sounds as Bb on the piano, hence the former is called a Bb clarinet or cornet. Sometimes a clarinet is so constructed

that its C is A on the piano. In this case, the former is called an A clarinet. If a French horn's C is F on the piano, it is called an F horn. If an alto horn's C is Eb on the piano, it is called an Eb alto. If a piccolo's C is Db on the piano, it is called a Db piccolo.

The question is asked: Why cannot the cornet be tuned higher so that C on the cornet is the same as C on the piano? And, why cannot the French horn or alto horn be tuned higher or lower so that the piano and horn correspond? The answer lies with certain physical properties of the instruments which must necessarily be taken into account in their manufacture. A cornet of higher pitch could be manufactured but its tone would be thinner and more shrill. We might melt down a French horn and recast it with its fundamental tone a fourth lower, but we would then have no longer a French horn. The instrument would have lost its individuality. Its wonderful characteristic tone would be replaced by something entirely different. Imagine what would happen to your piano if you tried to tune it several steps lower or higher! It would be almost as unthinkable as trying to make a human being taller or shorter.

Suppose it is required to arrange a melody so that a violin and a cornet may play it in unison. Now the Bb cornet is pitched one whole step lower than the violin, hence the music for the cornet must be written a whole step higher or the latter will be playing one step lower than the other. Therefore, if the melody is in the key of F for the violin, for instance, it must be transposed into the key of G for the cornet. Again, if a melody is to be played in unison by the cello and Eb alto, and the cello is playing in the key of Db, the Eb alto part will be in the key of Bb, or a minor third (a step and a half) lower than the original key. This is because the music for the former must be raised a major sixth to compensate.

The key in which music is written and in which the instrument is to be **played** is denoted by the usual signature on the staff; while the key to which the fundamental tone of the instrument is to be **tuned** is indicated by a caption in the upper left hand corner of the page, such as "Bb Cornet" or "Clarinets in A." The playing key and the pitch key have a definite relation to each other, but are not necessarily the same and must never be confused. Thus "Cornet in Bb" means that the instrument is **tuned** to Bb on the piano; but, while so tuned, it may **play** in **any** key.

To determine the key to which a wind instrument part must be transposed, let the arranger observe the following rule: Count down from C to the key in which the instrument is pitched; then transpose the desired part that much higher than the original key. Thus from C down to Eb is a major sixth, hence the Eb horn will play a selection written in the key of G a major sixth higher, or in the key of E; from C down to A is a minor third, hence a composition in G would be played by the A cornet a step and a half higher or in the key of Bb. In detail the rule may be tabulated as fallows:

For:	Transpose:
Bb cornet and clarinet.	A major second higher.
A cornet and clarinet	A minor third higher
F horn.	A fifth higher.
Eb horn.	A major sixth higher.
Bb trombone and baritone, treble clef	A ninth higher
D horn	A minor seventh higher.
Db piccolo.	A half step lower.

The question will now be asked, if we must have these bothersome transposing instruments, why is not one fundamental pitch for each sufficient? Why must the cornet be in Bb at one time and in A at another? The answer may be made plain by one or two examples.

Suppose a piano composition in A is to be arranged for orchestra. By consulting the rule we find that Bb cornet would play a major second higher, or in five sharps, and the A cornet a minor third higher, or in C. The latter tuning will be chosen not only as easier but as permitting more open and hence better tones. In fact, a multiplicity of sharps or flats presents such technical difficulties to wind instrument players that alternative tunings are a necessity. Even a player of considerable ability, if asked to execute a rapid passage in several sharps or flats, would be likely to throw up his hands and declare it unplayable.

Therefore the following rule is generally observed by arrangers and composers: If the composition is in flats, cornet and clarinet parts will be in Bb; if in sharps, these parts will be in A.

When trombone music is written in the treble clef it is transposed as for a Bb instrument and must be labeled "Trombone in Bb". The notes are then a ninth or an octave and one step higher than the original. This peculiarity is perhaps traceable to the military or brass band, where the valve trombone is often encountered. There a cornet player will sometimes take the place of an absent valve trombone player. This he can do by fingering the notes exactly as for the cornet. Another instrument, the baritone, occasionally presents the same peculiarity.

Transposing instruments must frequently change from one tuning to another very quickly in the midst of a selection. Some modern brass instruments are equipped with a valve which makes the change instantaneous; others must have pieces of tubing inserted near the mouthpiece or near the tuning slide. While this change should take only a few seconds, care must be exercised or the leader will find that it has not been done accurately, and the instrument thrown out of tune as a result.

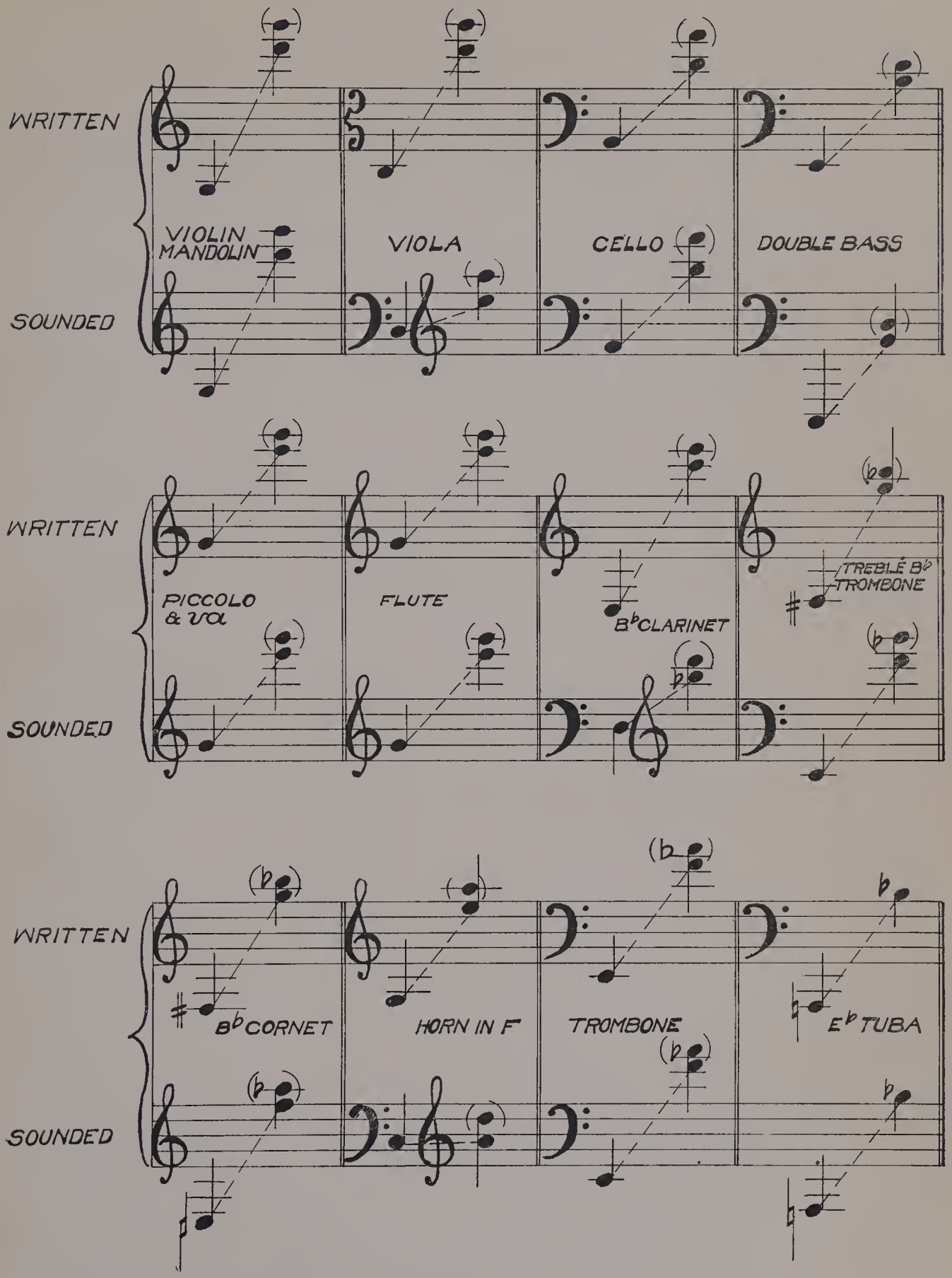
With the clarinet this change is impossible and the player must possess two instruments; one in Bb and one in A. This is hard for many parents to understand and they will declare that they cannot afford to buy two instruments, which may be true. A serious problem is then presented to the leader. He may follow one of three courses: (1) suffer the clarinetist to remain silent during the playing of the compositions which require the missing instrument; (2) write out the transposition for him; or (3) by extensive searching procure music which does not require the use of the alternate instrument. Some collections are now published, the cornet and clarinet parts of which are all in Bb, and the horn parts are all in Eb. The use of such collections is commended to those having to face this problem.

But in many cases it will be found profitable, if not indeed always convenient, to make transpositions. The leader or an assistant may do this, or the player may be taught to do it himself, either on paper or at sight.

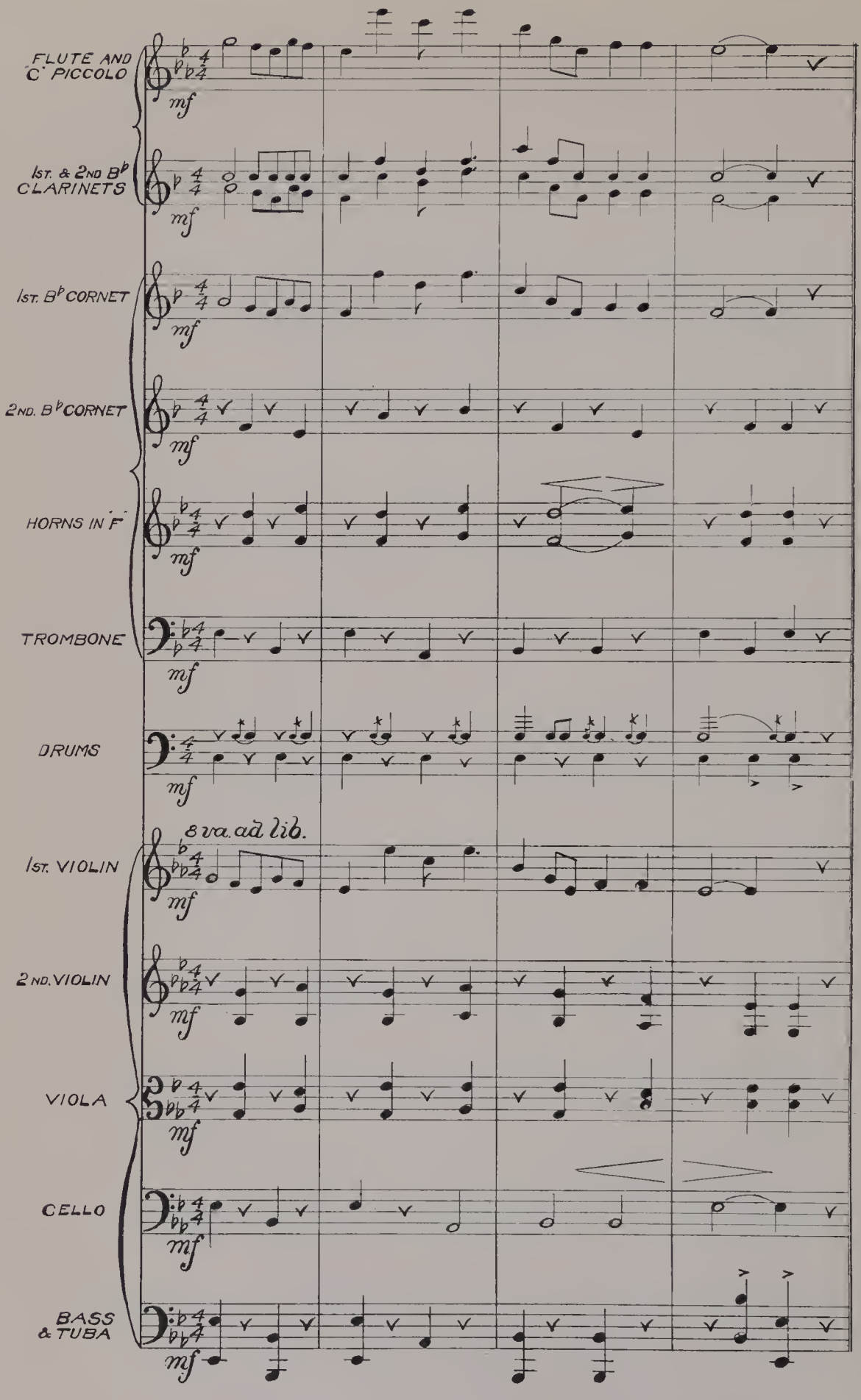
To transpose the part of a	To the same in	Transpose the part
Clarinet or cornet in A	Bb	A half step lower.
Horn in F	Eb	A whole step higher
Horn in Eb	D	A half step higher
Horn in F	D	A step and a half higher
Horn in D	Eb	A half step lower.

Writing for drums can best be learned by observation and experiment.

RANGE OF INSTRUMENTS MOST PRACTICABLE IN SCHOOL ORCHESTRATION.



SAMPLE PAGE OF AN ORCHESTRA SCORE.
SWANEE RIVER



Writing and copying music is not so tedious if done in the right way. The music manuscript and the printed page of music each have their separate respective characteristics. In making characters in music notation, *write* them; do not necessarily try to print them, any more than you would try to imitate printed characters when writing English. The following fundamental rules of music penmanship may be helpful:

Hold the pen as for ordinary use, except that the holder must slant in the opposite direction from the writer, and must rest between the index and middle fingers. The point will then be directly toward the writer.

There are only two strokes in writing music: (1) an up, or heavy stroke, and (2) a down, or light stroke. The *up stroke* is really a stroke to the right with a slightly upward pressure sufficient to spread the points of the pen a full 1/16 of an inch. The *down stroke* is used principally for stems of notes, and for measure marks or bars. It should be made as lightly as possible.

The head of a quarter note is made with a single "up" stroke. Press the pen carefully first lightly, then heavily, then lightly, the while moving it to the right and upward a little over 1/16 of an inch. The points should trace a perfect oval, the ink filling in between. After an hour's practice, notes can be written thus very easily and rapidly.

Make the stems after making the head, always with a light down stroke. When writing a single melody line, all stems point toward the middle line of the staff.

A *leger line* is made with a light horizontal stroke; the head of the note is then made with a heavy up stroke alost at right angles to the line.

The *head* of a whole or half note may be made with two moderately heavy "up" strokes, curved slightly toward each other.

A *whole* or *half rest* is a single heavy horizontal stroke.

A *quarter rest* resembles an ordinary check mark (✓): a heavy oblique downward stroke, followed, without lifting the pen, by a light upward stroke.

An *eighth rest* is something like a figure 7: a heavy stroke to the right followed by a light downward stroke.

A *sharp* is made with two light down strokes very near each other and of ample length; followed by two very short, heavy cross strokes a little farther apart (♯).

A *natural* is made with a light down and then a heavy cross stroke, like a letter **L** followed by two similar strokes in reverse order, like a letter **L** inverted (♮).

A *flat* is made with a light down stroke with the outline of the right half of a heart appended to the lower end. The upper part of the "heart" should be made with pressure, the lower part lightly (♭).

Clefs and the manner of making them are unimportant and need cause the writer no worry, as anything even slightly resembling one is easily recognized. Furthermore, it is not necessary to make a clef at the beginning of each line. Simply write the clef at the beginning of the piece or movement and draw a double bar at the beginning of each succeeding line to indicate that the clef and signature are understood to be the same.

Always mark off the measure before filling in the notes.

Don't crowd. An otherwise legible manuscript is spoiled by trying to economize on space.

Practice and persevere! You will gain time in the end and be able to make a much better looking manuscript besides.

CHAPTER EIGHT

THE BAND

A brass band should be organized in every school in addition to the orchestra. The band serves a different pedagogical purpose and is intended to appeal to a class of boys that the orchestra will not at first interest.

The band is not conducted on as high an artistic plane as the orchestra; in fact it makes no such pretentions. Rag-time, jazz, and popular "hits" may be played almost without apology. Some boys, in fact, I fear I should say many boys, have no higher interest in music at first, even though they may have much latent musical talent. It is this class of pupil that the band reaches, and eventually leads to something better, for the band may play good music as well. However, it is better to play lighter music well than better music poorly. "It is not so much a question of what you play as how you play it."

The band also serves a purpose in the school life. It is the most acceptable means of furnishing music for out-of-doors. In the orchestra the bulky cellos and double-basses require their players to remain stationary while performing; marching is impossible; the volume of tone is not sufficient to carry far in the open; and the action of the weather upon stringed instruments may be harmful. Therefore for football, baseball, track, arbor day, pageants, festivals or any out-door, or even many indoor occasions where a large number of people participate or attend, the band is an attraction, and often almost a necessity.

Even when not actually needed, the presence of the band is a stimulant to the musical life of the school and community. It can lead the "rooters" at the game in the singing of patriotic hymns, and it can enliven almost any occasion by its characteristic martial tones. It creates and sustaines an interest in music among both pupils and patrons which might never be aroused by the orchestra with its limitless but limited sphere. It is a form of musical entertainment which is democratic and which all can enjoy.

Composition of the Band.

The band may contain all the principal instruments of the orchestra with the exception of the violin, viola and cello. When the band parades of course the double-basses and kettle-drums, too, must be left behind. Certain other instruments also are added, which are not found in the orchestra, chief of which is the Euphonium, or, as it is more commonly called, the baritone.

The baritone horn is in appearance like the Eb alto or tuba, and half way between the two in size. In tuning, pitch, and fingering it is like the valve trombone, reading usually from the bass, but occasionally from the treble staff. Its tone is round, mellow, forceful and dignified.

For the bass, we rely upon the tuba, mentioned briefly in connection with the brass instruments of the orchestra. This instrument is made in various shapes and sizes, the most common of which is the "upright" Eb model shown in the illustrations.

The player may read the bass clef direct, or as though it were the treble clef with three sharps added or three flats subtracted. Thus a cornetist, picking up the tuba, might play a piece in the key of G as if it were in E, or one in F as though it were in D, ignoring the presence of the bass clef.

Both baritone and tuba may be taught after the manner of the other three piston or valve instruments, using the piano (if necessary) to ascertain whether the player is pitching his tones low enough. Though both are essentially transposing instruments, they are not treated as such and the music should sound just where it would if played on the piano.

The flute is replaced in the band by the piccolo—not the orchestra piccolo which sounds untransposed except that it is an octave higher—but the Db piccolo, which sounds the notes

a half step higher than written. Thus a composition in the key of Bb would be written in A for Db piccolo. (See chapter three).

The office of the first and second violins is performed in the band partly by the first and second cornets and partly by the first and second clarinets, the latter being considered most important in large concert bands.

There is also, as we have seen, a small cornet, pitched a minor third higher than the piano, a perfect fourth higher than the Bb cornet, and an octave above the Eb alto. This instrument, when present, may play in unison with or an octave higher than the Bb cornet, or it may carry an independent part. There is also a Eb clarinet having a similar relation to the Bb clarinet. The A clarinet is not used in the band, and the Eb cornet and the Eb clarinet are rapidly falling into disuse.

The work that the viola does may be taken over by the altos, mellophones or horns. Any or all of these may be present, generally pitched in Eb. The baritone is the substitute for the cello. Being one of the most pleasing solo instruments for band, it is as admirable and versatile an instrument in the band as the cello is in the orchestra.

The tuba is the bass and the foundation of the band, and without it it is impossible to have a successful band. The tuba is as necessary as any single leading melody instrument; for the melody can be taken by some other instrument if necessary, but nothing can take the place of the tuba. The baritone and even the trombones may occasionally play in unison with the tuba, but if the latter is lacking the bass of the former seems weak and unconvincing.

The work of the drums and traps is essentially the same in the band as in the orchestra, though for parade work the percussion section is necessarily limited to the bass and snare drums and cymbals.

Except in elaborate selections which partake of the nature of orchestral music, all instruments play almost continuously. While the horns rest two-thirds of the time in the orchestra, they are always tooting away in the band. While the cornets are hushed much of the time in the orchestra, they are almost never still in the band. Trombones and tuba, which attract attention by their entry after periods of silence in the orchestra, get little if any rest in the band. The clarinet is never still and even the piccolo is squealing, partly out of tune, most of the time. Here, again, the band appeals to the boy. Who wants to sit and hold an instrument on his lap while the rest are playing perfectly good music? The average boy doesn't want to be still, and he need never be in the band!

The organization and administrative conduct of bands should be patterned after the orchestra plan. School credits should be allowed on the same basis. Where the same pupils play in both, credit for each should be allowed.

A band may be started with any combination of instruments, and those wanted most added as found or developed. A cornet, clarinet, alto, trombone, baritone, tuba and drums make a very nice small combination. Add, if possible, in order, one or more cornets, clarinets, trombones, altos, baritones and tubas. From sixteen to twenty-five instruments are desirable for best results, and from thirty to fifty may be used with fine effect.

The designations "first" and "second" are not used exactly as in the orchestra. Instead of two we have four divisions which are designated as "solo", "first", "second" and "third", though occasionally the straight numbering of parts from one to four is found.

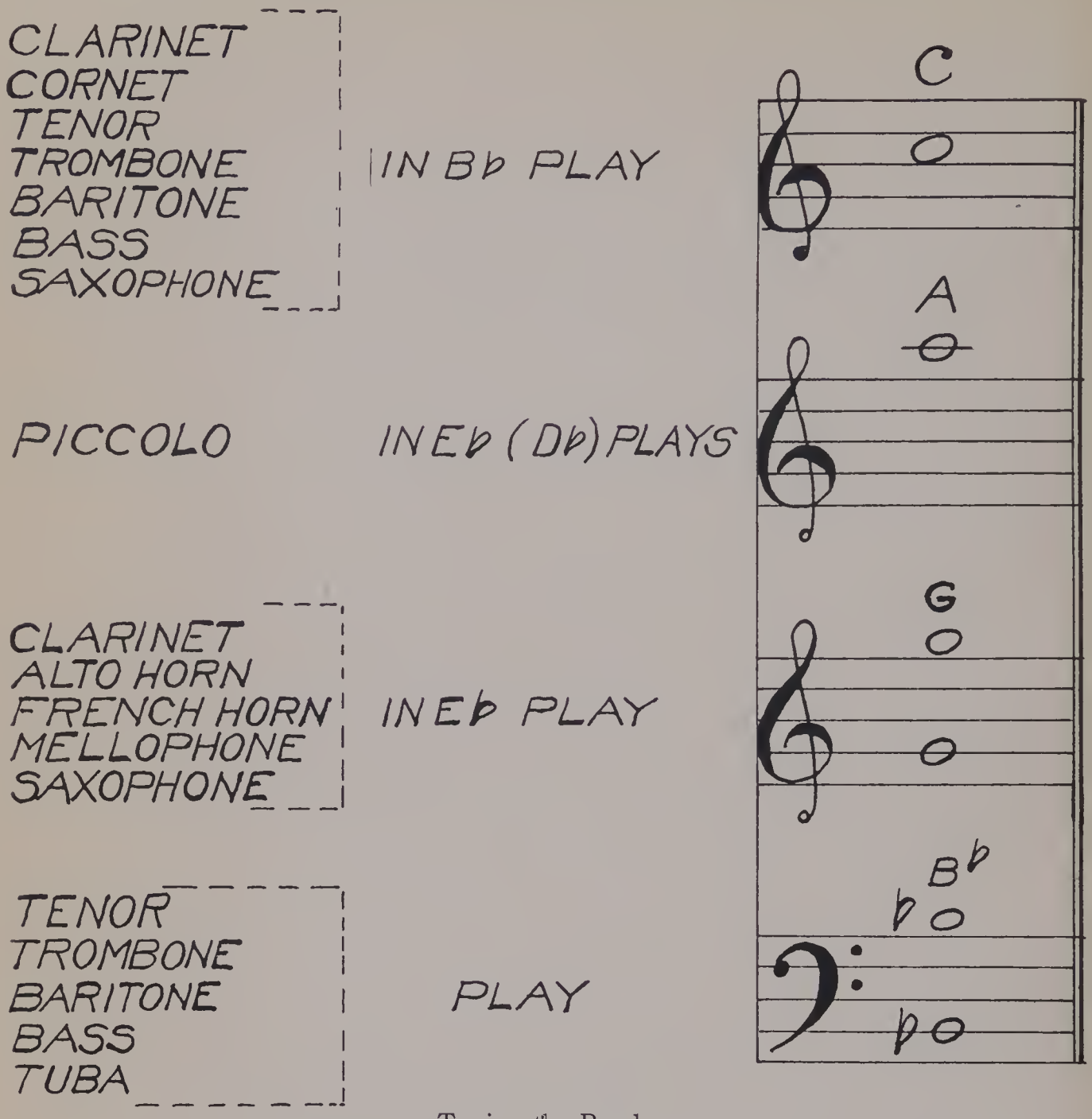
A band of twenty-two pieces might be listed as follows:

Piccolo; Eb clarinet; solo, 1st, 2nd and 3rd Bb clarinets; solo, 1st, 2nd and 3rd Bb cornets; solo, 1st, 2nd and 3rd Eb altos; solo, 1st and 2nd trombones; Bb bass (3rd trombone); baritone; Eb bass; snare drum; and bass drum with cymbals.

One or two extra solo cornets are especially desirable. The Eb cornet, oboe, bassoon and saxophones are often found in large bands; and for concert purposes also the string bass, tympani, bells, traps, etc.

The band may be seated in a semi-circle with the piccolos, clarinets and trombones on the director's left, the cornets and altos on the right, and the bass, baritone and drums in the center; or baritone and bass may be placed just in front of the center.

To tune the band, take the pitch from the solo Bb clarinet, or from the oboe, if present. The other instruments then tune in unison by sounding the following tones:



Tuning the Band.

(See tuning for band in Chapter Four).

When the band marches or parades the trombones and basses may constitute the front row or rank, and other instruments in following rows according to size, the smallest last, except the drums, which bring up the rear.

The band on the march is under the immediate direction of the "drum major." All commands for playing, marching, halting, etc., whether emanating originally from the regular leader or not, are signalled to the band by means of the drum major's staff. The leader himself may act as drum major, but it is better to train and use an older member who possesses a dependable sense of rhythm and general good judgment.

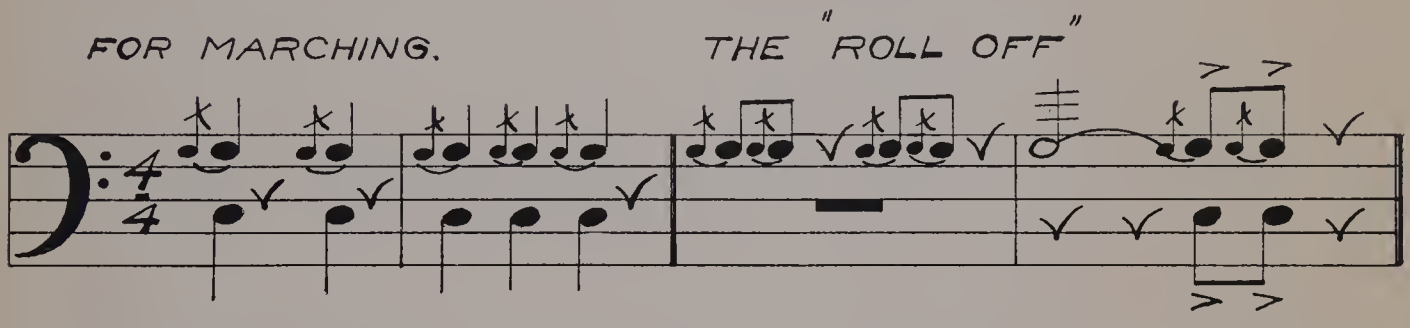
The drum major marches in front of the band, holding the staff near the larger end or head, the ferrule or smaller end pointing upward and a little to the right. He keeps the time by alternately lowering and raising the staff a distance of about six inches. The most important signals are as follows:

To March. Bring the staff to an angle of forty-five degrees, pointing upward and forward; extend the left arm to its full length; pause a moment; restore staff to its regular position. The players immediately step off, left foot first, to the beat of the drums and cymbals.

To Halt. Hold the staff horizontally above the head with both hands, lower it to the level of the hips with a quick movement.

To Turn to the Right or Left. Point the staff horizontally in the required direction with the extended right arm or left arm, respectively; continue pointing until the turn is completed; then point forward as in the signal to march; and restore the staff to its regular position. Keep time during the turn by slightly lowering and raising the staff.

To Play. Face toward the band, and extend the staff with the right arm, toward the band. The drummers then cease the usual beat for marching and "roll off."



Meanwhile the drum major faces front again and continues keeping time. The band begins to play on the next beat after the "roll off."

To Cease Playing. Face toward the band and extend the staff in the same manner as to play.

The drum major may signal for attention preceding each command by blowing a whistle. He should practice the signals in private until they can be done with reasonable grace of movement. Expert drum majors take pride in a staff which presents a "very bright and showy appearance, the white nickel reflecting the light very effectively during the evolutions, which are such a spectacular and applause-producing part of a drum major's duties."

In the absence of a regular drum major's staff, a bamboo or other light pole with or without decorations may be used.

CHAPTER NINE

THE VALUE OF THE ORCHESTRA

I. Educational.
   (a) Mental, moral, and social value.
   (b) Orchestral routine and ensemble drill.
   (c) Musical literature.

II. A Necessary School Organization.
   (a) Special music for public programs.
   (b) Incidental music for plays and pageants.
   (c) Accompany cantatas and operettas.
   (d) Enliven school assemblies.
   (e) Independent programs.

III. Vocational.
   (a) Partially.
   (b) Wholly.

I. Educational.

In deciding what should be taught in school and what should not, it is well to say that those subjects which have a definite educational value should be recognized as such, and those which do not, should be classed as special activities. At first classed with athletics and social clubs as a sort of outside activity, music has now in practically all progressive communities been given a place, and in many cases, a prominent place on the regular school curriculum. Credit is given in any course, with certain restrictions, and universities and colleges are coming to accept music in any well administered form in lieu of other entrance requirements.

Why has this change come about? It is chiefly because music teachers and supervisors have at last been able to convince superintendents and other educators of the high and practical value of music as an educational medium. For example, music can be taught at less expense per capita than many other so-called "special" subjects, because it can be taught in larger classes. It has a powerfully democratizing influence on the minds of the pupils, for it requires maximum individual effort and at the same time perfect co-operation. The pupil cannot choose his own pace, but must think at a GIVEN and EXTERNALLY FIXED RATE OF SPEED.

This is true of all forms of ensemble music. Orchestral music, however, has a unique value as a means of:

(a) Mental, moral and social value.

In addition to what has been said for music in general, orchestral music requires most vigorous concentration. This is due to the fact that if the player loses his place, he is out; he cannot find it again so easily as in a vocal class or chorus. One hundred percent accuracy in counting beats and rests is required. Suppose the cornetist has thirty-two measures rest, or one hundred and twenty-eight beats of silence to count, at the end of which he must burst out with a loud tone of high pitch, alone. An error of only one count would be fatal; it would ruin the performance. And this counting must be done while other players are playing passages of varying character and interest; perhaps while some listener moves or otherwise distracts his attention; and while he may be retuning or making some other change or adjustment in his instrument. This, with a student of high school age, no doubt represents the acme of concentration and self-control.

Most subjects taught in school from the kindergarten to the university foster the idea of individual excellence. The means of surpassing, rather than assisting others, is empha-

sized. For this reason athletics are encouraged, being looked upon as a socializing force. It is true that they do require a certain amount of so-called "team-work", but there is always some individual, the "star", who detracts attention from the rest by his special work. It may not always be the same one; but attention is usually focused on one individual or another much of the time.

Herein lies the superiority of the orchestra—"a collection of instruments blended and fused into one." They are ALL working together ALL of the time. No other agency inculcates such a condition of equality and fraternity. An American general, at the time of our entrance into the World War, having watched the rehearsal of a well-known orchestra, enthusiastically prophesied that if our fighting men could learn to work together as those players, no foe could withstand our armies.

(b) Orchestral Routine and Ensemble Drill.

While the purely educational side of school music is placed at the head of our list, the musical side should be placed as a close second.

No player can be a musician until he has become thoroughly schooled in ensemble, or the science and the art of performing with other players. Many a girl who has taken piano lessons for years and is considered a beautiful player, cannot accompany one solo voice satisfactorily, much less play as one instrument with a large orchestra. She thinks only of herself (if she thinks at all)—of her own rhythm, her own interpretation, caprices, fancies and whims. She is conscious of herself only as a solo performer. She cannot lose her individuality and submerge herself in the great whole. Here, then, especially in communities where there is no conservatory of music large enough to afford such facilities, the high school orchestra is the logical and sometimes the only solution of the problem of ensemble performance, so necessary to the full development of the artistic performer.

(c) Musical Literature.

Most of the musical literature known to the American public is pianistic. When one says "My daughter is taking music lessons," she is understood to mean pianoforte lessons, as a matter of course. The piano is perhaps more serviceable and popular than any other instrument, but the music for it is necessarily of somewhat limited scope and "pianistic" nature, as compared with the big field and great possibilities of orchestral literature. The presence of a good orchestra in a school or community widens the horizon of the local music-loving world greatly.

II. A Necessary School Organization.

(a) Special Music for Public Programs.

Under this heading may come declamatory contests, debates, lectures, and miscellaneous entertainments, whether for the school or the public, at the assembly hour or in the evening, paid admission or free. An opening selection by the orchestra pleases everyone, produces a more informal and even home-like atmosphere, and "breaks the ice." At an athletic rally, or celebration after a victory, every pupil, teacher, official and patron can appreciate the value of a live orchestra.

(b) Incidental Music for Plays and Pageants.

Because of the dramatic qualities of the tones of the different instruments, and because of the wide range of possible dynamic variation, an orchestra is indispensible to the fullest success of any dramatic production. The introduction, overture, intermezzo, or soft accompanying theme during spoken parts or filling in the silent scenes of dramatic tension, or the triumphal march at the close, need not be elaborate or difficult—only appropriate.

(c) Cantatas, Operas, etc.

Most standard cantatas and oratorios are of a somewhat dramatic character, and lack much when given with only piano or piano and organ accompaniments. Few school or-

chestras can provide all the instruments necessary for such a production, but many can furnish a nucleus which may be rounded out by alumni, local amateurs or even professional players. No effort or expense should be spared to make the orchestra as full as possible, however simple the production.

(b) Independent Programs.

While the orchestra exists more to serve than to be served, it may well plan to give one or more special orchestra programs each year, the numbers being occasionally interspersed with vocal solos, quartettes, readings or other attractions. If the orchestral numbers are well chosen, well arranged and well played, even a somewhat apathetic community will respond if the advertising campaign has been well managed and if the price of admission is not too high; or better still, if it is free to the public and is followed by some other feature, as for instance, a community sing. This interests the patrons of the school in the work of the orchestra and music department generally, and helps the officials of the school to feel that they are justified in making recommendations for the expansion of the work.

III. Vocational.

No one more than a good musician deplores the "musical fool" who knows nothing but music, but does not know how to relate it to life. However, it is impossible for a child to study everything. Many pupils at a critical period are confronted with the alternative of giving up school or giving up music. But when music is sufficiently recognized on the school curriculum this is not necessary. The pupil may take music as one of his regular studies and enough other academic subjects to round out his education. This enables many a musician to get an education, and permits many a bookworm to round out his schooling with that thing in education most necessary, next to the three R's for the happiness and culture of every man, woman and child—music. Compare Shakespeare's:

"He that hath no music in his soul . . . . is fit for treasons . . . ."

with President Wilson's terse war-time statement:

"Music is a present national necessity,"

and Major-General Wood's:

"It is just as necessary that our soldiers learn to sing as it is that they have guns and learn to shoot."

The significance of the vocational side of our question is under-estimated by most educators, because they seem to assume that the number of those who expect to make music a vocation is insignificantly small. One trial in a city of any size will usually show that an astonishingly large number hope at least to supplement their incomes by teaching, accompanying or playing in orchestras. Statistics show that more people make their living in whole or in part through some form of musical activity than in any other profession except school teaching. The American people have been spending over $600,000,000 annually for music. Any well trained musician can earn a good livelihood, and many high in the profession receive as much as $100,000 annually. It is doubtful whether incomes are higher in any other profession.

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APPENDIX A

ACOUSTICS

Acoustics is the science of sound. Sound is something heard. The cause of sound is the displacement of air caused by some vibrating body. This displacement takes the form of sound waves in which the air molecules are set in motion in various ways. These sound waves reach the human ear and produce the sensation of sound.

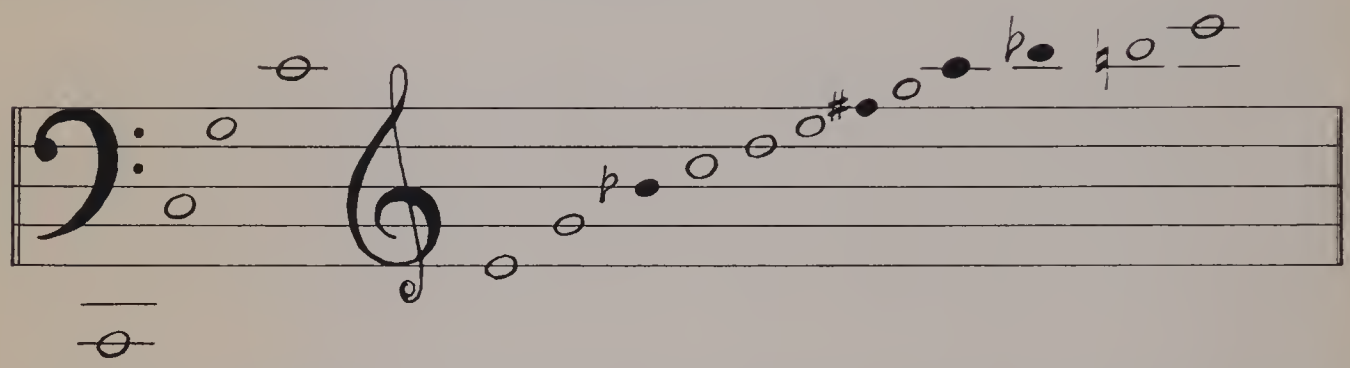
Sound waves of regular length and frequency make tone. Those of unequal length make noise.

The sound produced by a string vibrating in its entire length is its fundamental or natural tone. It can, however produce many other sounds at the same time, subdividing as it vibrates. These are called harmonics or overtones.

If a string is lightly touched exactly in the middle and then set into vibration the resulting tone will be exactly one octave higher than the fundamental and this is usually called the second harmonic.

If the string is divided into thirds, the resulting tone is an octave and a fifth higher.

The first sixteen harmonics would be as follows. The first note represents the fundamental which is usually called the first harmonic.



It must be remembered that a string never does vibrate simply as a whole, but that to this vibration as a whole, partial vibrations are always added in varying numbers. That is to say, we never hear an absolutely pure tone, but always one accompanied to a greater or less degree by certain of its harmonics. These harmonics are largely determined by the place the bow travels over the string or where the finger plucks it in the case of the harp. Every player of stringed instruments learns that bowing near the bridge produces one quality of tone and bowing farther away a different one.

Pipes.

There is another mode of producing musical tone, by pipes. In these the vibrating body is the column of air contained in the pipe. The pitch of the tone depends on the length of the pipe and the quality of the tone depends upon the shape of the pipe. A pipe may be open at one end only, or at both ends and the column of air within it behaves differently in the two cases.

A light steady breath blown across the end of an open pipe sets the air within it to vibrating and the fundamental tone of the pipe is heard. By blowing a little harder the second harmonic or the octave of the fundamental is heard. Blowing harder still the whole series of harmonics can be produced, but the tones indicated by the black notes are false in pitch and are not used by players of wind instruments.

The stopped pipe will produce only the following harmonics. Those indicated by the black notes are false in pitch and are not used.

The range or compass of all wind instruments is founded upon this harmonic series.

The Brass Choir.

The instruments of the brass choir utilize the harmonics 2 to 8, with the exception of the French Horn which utilizes those from 2 to 16. Originally these instruments were capable of producing only the tones of the harmonic series, the French Horn alone being capable of producing the half step below each harmonic, or open tone as they are called, by stopping the bell of the instrument with the hand.

Then the trombone was invented, equipped with a sliding tube which lengthened the instrument until the player could produce all the semi-tones between the harmonics except those between the first and second, the length of tubing necessary for this extension being too great to be practicable. In the middle of the last century the invention of the piston valves made possible the playing of the chromatic scale upon any of the brass instruments, the three valves performing the same duty as the slide. The following table will explain these inventions.

Table of Valves.

Second valve lowers each open tone (harmonic)	½ step.
First valve lowers each open tone (harmonic	1 step.
Third valve lowers each open tone (harmonic)	1½ step.
Combining	
First and second valves lower each open tone (harmonic)	1½ step.
Second and third valves lower each open tone (harmonic)	2 steps.
First and third valves lower each open tone (harmonic)	2½ steps.
First, second and third valves lower each open tone (harmonic)	3 steps.

Table of Slide Positions.

Note.—When the slide is in its shortest position it is said to be in FIRST POSITION, and the tones produced are the harmonics or open ones.

First position,	slide closed,	produces open tones.	
Second position,	slide extended 3½ inches,	lowers each open tone	½ step.
Third position,	slide extended 7 inches,	lowers each open tone	1 step.
Fourth position,	slide extended 10½ inches,	lowers each open tone	1½ steps.
Fifth position,	slide extended 14 inches,	lowers each open tone	2 steps.
Sixth position,	slide extended 17½ inches,	lowers each open tone	2½ steps.
Seventh position,	slide extended 21 inches,	lowers each open tone	3 steps.

Comparison.

First position equals open tone (no valves) produces harmonic series.	
Second position equals second valve, lowers open tones	½ step.
Third position equals first valve, lowers open tones	1 step.
Fourth position equals third, or first and second, lowers open tones	1½ steps.
Fifth position equals second and third, lowers open tones	2 steps.
Sixth position equals first and third, lowers open tones	2½ steps.
Seventh position equals first, second and third, lowers open tones	3 steps.

It will readily be seen that the extension of three full steps bridges the gap between the second and third harmonics but does not span the wide interval between the first and second. This explains why the tones between the fundamental and the second harmonic are not used.

Because of the impracticability of a longer slide and more valves all the instruments of the brass family are manufactured with a relatively small bore which enables the player to produce the upper harmonics with greater facility while the slide or valve combinations enable him to play the chromatic intervals. In some instances a fourth valve has been added which lowers each open tone two and one half steps, which, with the combinations, enables the player to produce all the tones between the fundamental and the second harmonic. This, however, necessitates using tubing with a larger bore which renders the playing of the upper harmonics more difficult and its usefulness is limited.

The French horn is built of tubing with a very small bore or diameter and is capable of producing the harmonics 2 to 16, numbers 4 to 10 being the most facile of execution.

Wood Winds.

The instruments of the wood-wind choir utilize the fundamental and the nearest harmonics, seldom using those higher than the fifth. The bore of the tube is relatively larger than that of the brass instruments and the tubing is pierced by small holes at regular intervals. The performer may lengthen or shorten the vibrating air column at will by closing or opening these holes. Half of these holes, usually those producing the C scale, are stopped by the fingers of the player. The remainder, those producing the sharps and flats, are stopped by keys or levers which are operated at will by the fingers of the player. These keys are so arranged that they may be opened by fingers that are unoccupied. Modern improvements have added extra keys and somewhat lengthened the tubing by adding keys which are closed by the little fingers of each hand.

In addition to blowing harder to produce the harmonics above the fundamental, tiny holes are made near the mouth-piece and closed by keys operated by the left thumb of the player, which, when opened, greatly facilitate the production of these harmonics. Thus the flute, oboe and saxophone players may play from low C (or B-flat) up to C-sharp by removing one finger at a time in succession. All these tones are fundamentals and are said to be in the first or fundamental register. By opening the octave key he may use the same fingering and the tones produced will sound an octave higher. (The flute has no octave key as the lips of the player, the source of tone production, are capable of greater control than the reeds of the other woodwind instruments and saxophones.) The bassoon differs only in that the scale in the fundamental register is from G up to F and the second register begins on F-sharp.

The clarinet is the one representative of the "stopped" pipe in the orchestra or band, in that the second harmonic with its entire scale is missing. Its middle register corresponds to the third harmonic with its series of tones, pitched an octave and a fifth above the fundamental. This wide gap between harmonics necessitates the construction of a tube long enough to produce the tones through an octave and a fifth. All the fingers of both hands and the left thumb are used, with certain fingers responsible for more than one key or a key and a hole. This accounts for the large number of keys on the clarinet. The Boehm system clarinet is provided with duplicate keys in some instances to obviate sliding the fingers from one key to another in quick succession. The range of the first or fundamental register in the clarinet is from E below the treble staff to B-flat, third line. The same fingering with

the register key added produces a similar succession of tones starting on B, third line of the treble staff.

In all the wood-winds and saxophones the tones above the second or middle register are produced by irregular placing of the fingers, leaving one or more of the holes nearest the mouthpiece open to serve as additional register keys.

Comparison.

The brass instruments all utilize the upper harmonics and produce the intervening tones by means of valves or slides which lower the harmonics by lengthening the tubing, while all the woodwinds and reed instruments utilize the lower harmonics and produce the intervening tones by means of holes in the tubing, the opening or closing of which lengthens or shortens the vibrating column of air within the tube.

The stringed instruments use only the fundamentals, except for certain effects, the different strings and their shortening by the fingers of the player producing the different series of tones.

NOTE—For the further study of Acoustics, the reader is referred to Helmholtz, Lavignac "Music and Musicians" or any other standard work on the subject.

APPENDIX B

DICTIONARY OF MUSICAL TERMS

Accel., Accelerando. Gradually increasing the velocity of the movement.

Adagio. Slow, but quicker than largo and slower than andante.

Ad libitum. At will.

Agitato. Agitated, hurried, restless.

Al fine. To the end.

Allargando. Growing broader, i. e., louder and slower.

Allegretto. Rather light and cheerful but not as quick as Allegro.

Allegro. Quick, lively.

Andante. A movement in moderate time but flowing easily, gracefully. Andante literally means "going."

Andantino. A little quicker than Andante.

Animato. Animated.

Arco. With the bow.

Arpeggio. Playing the notes of a chord consecutively (harp style).

A tempo. In time. In the regular tempo.

A una corda. On one string.

B. D. Bass drum alone.

Cadenza. A cadence; an ornamental passage.

Chalumeau. The lowest register of instruments of the clarinet family.

Chanterelle. The highest string of any instrument of the violin family.

Colla Voce. With the voice; implying that the accompanist take the time from the singer.

Coloratura. Ornamental passages, embellishments.

Corno. French horn.

Cres., Crescendo. Increasing power of tone.

D. C., Da capo. From the beginning.

D. S., Dal segno. Directing a repetition from the sign.

Divisi. One-half the performers must play the upper notes and the others the lower notes.

f., forte. Loud.

ff., fortissimo. Very loud.

Grandioso. Grand, noble.

Grazioso. In a graceful style.

Larghetto. Not quite so slow as largo.

Largo. A slow and solemn degree of movement.

Legato. In a smooth, graceful manner.

Lento. Very slow.

Loco. Place; return to the written register after a series of notes have been executed an octave higher.

Maestoso. Majestic, dignified.

mf., mezzo-forte. Moderately loud.

Marcato. Well accented.

Meno mosso. Less movement; more slowly.

Moderato. Moderately; in moderate time.

Pesante. Heavy; impressively.

pp., pianissimo. Extremely soft.

p., piano. Soft.

Piu mosso. More motion, quicker.

Pizz., pizzicato. The strings are to be plucked with the fingers.

Portamento. Gliding of the tone from one note to the next.

Poco a poco. Little by little.

Presto. Quickly, rapidly.

Rall., Rallentando. The time gradually slower.

Rit., Ritardando. Retarding; delaying the time gradually.

Saltando. Skipping the bow upon the strings.

sf., sforzando. Forced; played with force and emphasis.

Signs. A dot above or below a note signifies staccato. ⁀ A slur, bind, tie. — Sustained. ⊤ Accented and sustained. < Crescendo. > Diminuendo. ∧ Forzando, accented. <> Crescendo and diminuendo. ∨ Up-bow. ⊓ Down-bow. 𝄐 Hold, or Fermata. 𝄎 Repeat preceding measure. 𝄋 Segno. Repeat from this sign. 𝄇 Repeat. ⊕ The coda mark. First time of playing disregard the sign. Second time (after D. C.) skip from this sign to the coda.

Sostenuto. Sustaining the tone.

Staccato. Detached; separated from each other.

Tacet. Be silent; a term to indicate that that particular instrument has nothing to play during a certain movement or piece.

Ten., Tenuto. Held on; sustained.

Tromba. Trumpet.

Una corda. On one string only.

Vamp. To improvise an accompaniment.

Vivace. Animated, lively.